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PRINCIPLES AND ORGANIZATION OF HIGH SCHOOL MATHEMATICS

A Symposium

FUNCTIONAL MATHEMATICS

C. C. TRILLINGHAM
Assistant Superintendent, Los Angeles County Schools

ONE of the forward steps in the improvement of mathematics instruction on the secondary level has been the increasing tendency on the part of mathematics teachers themselves to find fault with the values obtained from algebra and geometry as conventionally taught. Previous to the depression, the number of educators who questioned the content, the methodology, or the placement of such staple subjects was comparatively small. Their widespread traditional use was sufficient to dispel most doubt. However, since 1929, with business, government, education, and other important phases of group life undergoing sharp criticism and rigid analysis, the total curriculum offering of the schools has been subject to like scrutiny.

Major emphasis in recent curriculum revision has been given to those subjects and fields possessing maximum social values, while the social aspects of all subjects have been receiving increasing attention. High school mathematics is no exception. Its inherited position from the curriculum of the past is no longer sole justification for its continuance on the old basis. Mathematics must increase its service to youth if it is escape the knife of educational physicians seeking to trim nonfunctional elements from the modern instructional program.

Three Kinds of Mathematics Needed

For reference purposes, let us assume that there are three main phases of mathematics which demand consideration. ***First,*** there is the cultural, appreciational, historical, socialized, or interpretative phase, which should reveal how mathematics permeates everyday life. The relationship of mathematics to astronomy, physics, chemistry, engineering, architecture, aviation, music, art, business, and government itself should be made clear to those who would understand its social significance in the development of civilization.

Dr. L. T. Hopkins of Columbia University has pointed out recently that mathematics is the basis of science; science has given invention; invention has given the machine; the machine has given machine technology, which, in turn, has given increased production with decreased man power. Thus, we find mathematics basic to many of our social-economic problems which demand adjustment today. Rarely do boys and girls get this relationship in the typical mathematics, science, or social studies courses. Not only is mathematics basic to many of our problems, but it likewise should be given credit for many contributions to man's welfare.

It stirs the imagination to try to conceive of the mathematical planning

basic to the development of the Boulder Dam project, the Golden Gate Bridge at San Francisco, the Griffith Park Planetarium, the Los Angeles County annual budget, a naval target practice, a blood count in a physician's laboratory, the successful harvesting of a citrus crop, or the building of a new home. Every teacher with imagination should be able to extend indefinitely such possibilities. Opportunities for pupil research and contacts with real-life situations are limitless. *Every pupil should experience this phase of mathematics.*

Second, there is that phase often referred to as practical mathematics which, it is said, may be needed and used by the average person in any typical day of his life. This includes not only such fundamentals as addition and subtraction, but, also, such concepts, processes, or principles as relate to the life of the individual as a consumer and citizen, such as: the interpretation of graphs and simple statistics, the use and understanding of simple formulas, estimation, buying commodities and services, insurance, banking procedures, postal savings, budgeting, and the like. This phase should include mathematical experiences which most people have, to a considerable degree, in their normal life situations. *Every pupil should have access to this kind of mathematics.*

Third, there is a technical or vocational phase of mathematics. This type should be *restricted to those pupils who want to enter vocations* for which such preparation will be needed, and *those who naturally like this type of work,* because they enjoy details involving some degree of logic or puzzle solving. In other words, some pupils get a "kick" out of conventional algebra, geometry, or trigonometry, whether or not they may have occasion to use them vocationally.

Assuming the contention that appreciational and everyday mathematics should be provided all pupils, and that the more highly specialized and technical mathematics should be limited to those with actual needs or desires for it, let us see what mathematics the typical high school actually provides for its pupils.

According to Monograph No. 23 of the report of the National Survey of Secondary Education of 1932, most secondary schools still feature college preparatory algebra and geometry as the backbone of the mathematics program. In such conventional courses, time is spared for very little appreciational or everyday mathematics. Some schools do offer general or applied mathematics, particularly in the junior high school grades, but such courses are usually provided for the less able students who cannot do algebra or geometry, or for those who are majoring in commerce or industrial arts, in which cases its aims are still mainly vocational.

In general, we may conclude that the average situation is, perhaps, just the reverse of what it should be. Few pupils, if any, have access to those phases of mathematics needed by all. Many forward - looking mathematics teachers are aware of this problem, but recognize many difficulties in developing and applying a remedy. They ask perplexing questions as to how the new work should be organized and in what grades it should be offered. Certain curriculum experts maintain that appreciational and interpretative mathematics cannot be taught successfully, except in connection with, or when related closely to, courses in the other fields — social

studies, commerce, art, or science. Others contend that all the practical, everyday mathematics the average person will ever need should be acquired by the end of the eighth grade. Lacking definite and final answers to these questions, however, it should be said that one way to get light is through legitimate research and experimentation in the classroom. In the meantime, let us consider several possibilities.

Suggestions for Improving Mathematics Instruction

Assuming that algebra and geometry, as presently taught, should be limited to a comparatively small number of pupils who want to do such work for fun, or who need it for vocational purposes, the problem naturally follows as to how such pupils are selected. In the final analysis, the pupil personnel for such classes can be determined with maximum effectiveness only by a sound guidance program. Pupils' past records, their abilities and aptitudes, their vocational interests and needs, their future college plans and their chances for success, prognostic or achievement test results, the attitudes of parents, and other possible factors should all be given consideration. Many teachers point out that large numbers of pupils, who have no business in the conventional courses, enroll in them because parents insist on their meeting all college entrance requirements. In answer to that challenge, a director of admissions for one of California's largest institutions of higher learning recently made the statement that, although certain courses in mathematics are required for college entrance, there is no stipulation as to what shall be taught under such course titles.

Let us examine this implication in the light of a practical, instructional situation. A school was recently visited where classes in plane geometry were supposedly organized by X, Y, and Z ability groupings. It was discovered that the pupils in all three groupings were given the same assignments, were supposed to memorize the same theorems, were expected to work the same original problems, and all took the same departmental examinations, in spite of the fact that the highest I.Q. in the Z group was eighty-five. The only apparent effort to provide for individual differences was in the distribution of marks. It was generally understood that no pupil in the Z group would receive more than a "D" or an "F." These particular pupils were given failing grades for attempting to do a type of work ill-suited to their abilities, interests, or needs. The major contribution of plane geometry in this situation was the acquisition of a failure complex on the part of these pupils, who will, perhaps later, become disgruntled taxpayers.

As a possible improvement, it is suggested that all pupils who are now enrolled in ninth- or tenth-grade courses in mathematics should profit more from educational experiences in appreciational and everyday mathematics essential to all people, rather than through the usual traditional, academic courses in algebra and geometry. Those who need or want the specialized and technical courses in algebra and geometry should take them in their later years, say the eleventh and twelfth grades, because, at that time, they are more mature, their vocational interests are more established, such work naturally relates to the technical science courses, and would form a natural continuous sequence with any technical mathematics they would take in college or

the vocational school. Experimentation has proved definitely that pupils gain a much more thorough technical mastery in their advanced years. In fact, there is a rapid movement among colleges to do away with the entrance requirement for mathematics, even for the engineering school. They realize they can teach what is needed better when the student is in the vocational school; that it can be done in a shorter period of time, and be more effectively related to the vocation pursued. Some educators even recommend that all such courses be deferred until after the senior high school. This suggestion, however, is questioned by many teachers and administrators in the secondary school ranks.

This shift in emphasis should not necessarily reduce the number of mathematics instructors needed; rather it calls for the development of a more functional mathematics program for all students. Why should not teachers develop functional units involving pupil experiences in appreciational and everyday mathematics? Such units are desperately needed, and should include supplementary reading lists, practical problems, suggested excursions, visual aids, and varied types of activities.

Classroom research should assist teachers in discovering what everyday mathematics most people need, or what types of mathematics are used by various professions or trades, or how mathehmatics relates to life in general. There should, perhaps, be more reading, more discussion, and less computation (except that related to natural life problems) in this type of work.

Many teachers believe that plane geometry teaches pupils to think logically. As psychology now insists that "transfer of training" is neither extensive nor automatic, mathematics has lost one of its old justifications—that it would train in reasoning, analysis, and synthesis, and that this training could be applied to other problems of life; yet these were the traditional grounds upon which plane geometry was accorded the place of a compulsory study. But, allowing that there is some carry-over value, why should it be essential for youngsters to spend a whole year solving problems in terms of triangles, quadrilaterals, circles, and polygons? If and when a youngster really succeeds in starting with given facts, and moving through certain logical steps with reasons for each, and arriving at logical conclusions, why not apply this "logical reasoning" gained to the pupil's own problems, or to larger general social problems? For instance, in considering a common pupil problem, "Shall I go to college?" would it not be possible to set up the given facts, including such items as intellectual ability, definite financial possibilities, or willingness to work, vocational interests, desire to go to college, attitude of parents, and the like, and with these facts to develop certain logical steps ending in a justifiable conclusion? If the pupil decides he should go to college, could not like procedure be applied to the question, "What college or university shall I attend?" and so on.

Frequently, teachers state, "Presently organized textbooks do not give us the basis for the kind of mathematics you recommend for all students." It should be pointed out that never have new textbooks preceded new teaching, but rather have followed the research and experimentation of educational pioneers who have revealed the need for new works.

Adult education is one resort for

the individual who finds he lacks some mathematics to cope with his new life job. In a recent adult education class in mathematics in the Los Angeles City Schools, a young lady, who was clerking in a department store, explained to the teacher that she was a high-school graduate, but had not learned how to do fractions. She was afraid that unless she learned how to figure the total cost of 10½ yards of gingham at 22½ cents a yard she might lose her job. After six weeks of directed work in this class her weakness was overcome.

Another student in the same class had obtained a job with an importing and exporting firm, and was anxious to learn how to transform Italian lire, German marks, French francs into American dollars, and vice versa. After three weeks of evening work he was able to meet this occupational need.

Most adult education classes render genuine functional service. If such were not the case, the class members would vanish.

Finally, for the teacher who is reluctant to limit the sphere of conventional mathematics in the school's program, may it be stated, since both school life and human life are short, and since it is impossible to learn everything, it is necessary to use judgment and choice in selecting those things that will most directly minister to the pupil's efficiency and enjoyment.

In any event, it seems best not to attempt to overhaul the whole program at one sweep, but to seek gradual improvement where there is recognized need. It seems certain, also, that a revitalized mathematics depends upon greater consideration of pupil needs and interests, and of the problems of everyday life, rather than upon analysis of customary subject-matter.

FUTURE DEVELOPMENTS IN JUNIOR HIGH SCHOOL MATHEMATICS

WILLA M. MARSH
Supervising Vice-Principal of Fresno Technical High School and Junior College

THE field of secondary education has accepted the challenge to reorganize its procedure in terms of the needs, abilities, and interests of the whole child, and, by means of enriched experiences, equip him to find his place in a changing society. The attempt to make educational processes meet the new aims has caused a scrutiny of subject matter that has resulted, to some extent, in displacing seemingly sacred values. New materials, new methods, and new goals have been introduced in such fields as Science, English, and Social Science. New values have been discovered, as a result of these changes. Junior High School mathematics must likewise accept the task of establishing new goals, developing more effective methods, and accepting new values. Before new goals can be established, a careful analysis must be made of the needs of children entering Junior High School. It is a recognized fact that most teaching is on a level of two or three years above the child's understanding. This is particularly true in arithmetic, since permanent arithmetical achievement depends, mainly, upon the growth of concepts and the development of number relationships. Elementary arithmetic, however, emphasizes speed and accuracy in the fundamental processes to meet the requirements

of standardized tests. The task of learning arithmetic, in terms of the drill theory, is stupendous, and the majority of children are unable to master the fundamental processes by the end of the sixth year. With these facts in mind, it is readily seen that junior high school mathematics will lie in the field of arithmetic. If arithmetic is to be taught, certain changes in emphasis are suggested.

1. Emphasis should be placed on growth from one level to another, rather than on grade achievement. Some children may take twelve years to complete the required arithmetic.
2. Meaning and understanding of processes should be the main goal. The child has a right to understand what he learns. Many children multiply decimals, and place decimal points correctly, without having the least idea of the meaning of the process. Drill should follow understanding, not precede it.
3. The difficulty of the learning should affect the amount to be learned. A realization that number relationships and concepts are gained slowly will place much of the elementary materials in the junior high school.
4. Emphasis should be on informational mathematics and the interpretation of mathematical facts. Graphs may present, or misrepresent, facts. A graph may show the increased cost of education, but fail to show increased enrollment. Children must be taught to interpret mathematical data.
5. The majority of children will be consumers of mathematics, not producers. Problems involving computations to find insurance premiums may be left to the agent. It is most important, however, that children know the various types of life insurance, annuities, and endowments. The problem of the government in regard to social insurance, unemployment insurance, and Old Age Pensions should be presented. A discussion of fire insurance may emphasize the city rate, and compare it with the rate for other cities. The elimination of fire hazards, to reduce the rate, is important. Other forms of insurance should be discussed. A study of investments may consist of computations concerning the amount of interest, or emphasize safety as determined from the rate of income. The market value of stocks and bonds, reading the bond and stock page in the daily paper, or knowing where ta find the rating of companies may tend to encourage the idea that investigation should precede investment. Buymanship, also, has a vital place, when one considers that the largest amount of business is carried on in or for the home. The management of personal and home finances often determines success or failure to the individual. Amounts to spend for home ownership, food costs, clothes, and automobiles should be studied. Since a large per cent of buying is on the installment plan, it is of utmost importance that children get some idea of the interest rates that are actually charged by banks, private loan companies, and government agencies. The secondary school must teach children how, when, and where to spend money.
6. Mathematics, for mathematics sake, will always appeal to a small selected group who find joy in the solution of problems that puzzle. Provision should be made for these interests. Careful guidance should also be given those pupils who have specific vocational needs. Modern trends seem to indicate, however, that the high school of the future will place the mathematics required for vocations in upper division courses. In this way, mathematics for such courses as engineering may be more directly applied to the field, and studied when the maturity of the student makes it possible to accomplish the work in a shorter period of time.

Integration

Can mathematics find a place in an integrated program? With present aims and procedures, there is danger that mathematics may become incidental, or altogether lost, in a program of integration. The statement has often been made that the average citizen needs little mathematics. Justification may be found for the statement if a careful analysis of much of the present materials is made. The mathematics program, however, becomes invaluable when it accepts, as its real function, the task

of teaching people to do quantitative thinking, to acquire number relationships, and to foster growth of concepts. When mathematics really meets the life needs and interests of children, its importance to the other fields of learning cannot be sufficiently estimated. Time and specific conditions must determine integrated programs. For purposes of study, it is well to consider what contribution mathematics may be expected to make to other subjects.

Social Science. Social science is concerned with governmental problems relating to immigration, transportation, population, taxation, and industrial growth. The child is presented with graphs, tables, and large numbers in order that he may make comparisons, pass judgments, and form conclusions. The assumption is that the child can do the necessary quantitative thinking concerning such data. In reality, the majority of children are unable to interpret graphs, or to understand large numbers. Mathematics can help children acquire concepts of smaller numbers, and some idea of a number like a million. Tables with large numbers can then have real significance to the children. The problems of Social Science can be a motivating force for much of this learning, if the teacher of mathematics can have access to the units of study in the Social Science program.

English. Many failures in mathematics are in reality failures in reading. Every mathematics teacher should know the reading ability of each pupil. An appreciation of the difficulty of unfamiliar words or phrases is essential. The field of English has much to contribute. Mathematics, also, makes a contribution, if children have learned to think more clearly, and have gained power to express thoughts in an organized manner.

Science. Mathematics has always been closely related to, and considered necessary for, courses in High School Science. Mathematics will continue to serve the engineer, the research worker, and the technical expert. Now, in addition to this, mathematics attempts to provide for the needs of the majority, the consumer group. Before this phase of mathematics can satisfactorily function, science must also include in its function the needs of the whole group. The child can do little quantitative thinking in the field of buying, without the facts that science can provide. Knowledge of the efficiency of machinery, the value of foods, the durability of materials, can be provided through scientific research and analysis. Children must be taught to discriminate between reliable and unreliable information. Children must understand the relation of science to changing social conditions. Mathematics can well illustrate this in the study of investments. Industrial bonds may be considered a safe investment one year, and worth little or nothing in a few years, due to some invention or scientific discovery. New machinery, or scientific research, may increase production, decrease the number of workers, or affect profits. Children must be taught to expect change, to greet it with an open mind, to meet a new mode of living that is based on science. Mathematics assignments that encourage scientific interest and reading may profitably take the place of some of the abstract problems that require complicated computations.

Fine Arts. The relation of mathematics to the arts has long been realized. Perhaps additional emphasis can be given to make children

conscious of the place of form and symmetry. In a recent article, Raymond Wheeler states:[1]

> In the junior high school, mathematics should be taught mainly as a means of making more precise a vitalizing and interesting knowledge of form and precision in nature. Study form and symmetry in the architecture of the savage and in his methods of calculating. How were the pyramids built? How was land surveyed in the days of ancient Egypt? . . . . .
>
> Study ratios and proportion as they were used in the simple Greek art. Note that the more beautiful buildings are cheaper to build and are more desirable. This is an actual discovery of engineering science. Beauty means economy. Note symmetry in animal and plant life—curves, spirals, spheres, cylinders, orderly transformations from one curve to another, as in the veins of plants. Study bird's eggs, frost crystals, snow crystals, salt crystals, naturally formed jewels, spider webs, bee cells. Look for precision and mathematicals rules of a simple character found almost anywhere in nature.

The element of discovery can be an important factor as the child carries mathematics into new realms of interest. A mathematics that carries a child into a world of art appreciation will be more vital and more challenging.

The Teacher

Few teachers of mathematics realize that the first task of the mathematics teacher is to create a learning atmosphere that will be able to compete with the fears and feeling of inferiority in the class. When children dislike arithmetic, it is because they have been hurried and moved to the next process before the previous one has been learned. It is not long before the child has a feeling that he cannot learn arithmetic. The junior high teacher must accept as her work the elimination of these fears. Perhaps the first step in this process will be the teaching of elementary work that has not previously been learned. Children will be accepted on the level of their accomplishments and carried on to the next level. It is most necessary to make children feel that the existing level is legitimate, that they can learn, and that their task is to reach the next level. Children will like, and do like, arithmetic when they know they can learn, and when they experience the joy of achievement. The task of the mathematics teacher becomes easier, as abstract problems are replaced with problems of human interest. When number is connected with vital, living material, the field of mathematics has new significance for the Junior High School child. Mathematics presents an open field for experimentation and study. Teachers must accept the task of developing a program based on child's growth and needs.

Conclusion

The tendency to think of a child's education in terms of a process of growth from Grades One to Twelve will bring reorganization to all fields of learning. Changes in mathematics are inevitable. As we change the emphasis from computation to social arithmetic, care must be taken to keep topics on the level of the child's interest and understanding. If measurement of achievement is necessary, new tests must be devised in the terms of social arithmetic. Teachers must keep in touch with changes in elementary education, and be alive to changing social conditions. Without doubt, future development, involving worthwhile changes in mathematics, are mainly dependent upon the educational philosophy and vision of the teacher. If this challenge can be met, Junior High School mathematics will give enriched living and understanding, and will continue to maintain a vital place in the curriculum.

---

[1]Wheeler, Raymond Holder — "The New Psychology of Learning." National Council of Mathematics. Tenth Year Book. 1935. pp. 247-248.

MATHEMATICS INSTRUCTION IN JUNIOR COLLEGE

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MATHEMATICS instruction in junior college is an aspect of education "for effective participation in all those common understandings and coöperations which are necessary to sustain the best in our complex contemporaneous civilization which is American . . . (and) for productive living."[1] Implicit in this conception of mathematics instruction, "the dominant purpose of which is general to all the purposes of civilized life in so far as different students wish or can achieve them,"[2] is a conviction that mathematics is an essential element in complete social living. Effective instruction in mathematics then is to make junior college students aware of the mathematical factor in industrialized and urbanized America.

The Social Mission of Mathematics

Certain students must acquire, in preparation for their vocations, special mathematical skills. Students of commerce must achieve arithmetical facility and some knowledge of algebra and statistics to meet the needs of accountancy, finance, and modern business. Students in social sciences, particularly in economics, sociology, psychology, and education, must increasingly make use of statistics, algebra, and the calculus to manipulate the data of their respective fields. For progress in engineering and physical sciences, considerable proficiency in college mathematics, including engineering drawing, is necessary.

But the chief concern of junior college instruction should be for adequate citizenship. If algebra and geometry, hitherto almost universally specified in secondary curricula, owe their inclusion to more than tradition and educational inertia, they (and college mathematics) must justify their position by contributions to "social citizenship in American civilization."

At the outset, some cautions seem pertinent. Sometimes it has been rashly assumed that the mathematical items desirable and adequate for general education (admittedly the controlling purpose at junior college levels) can be decided by samplings and surveys to determine specific algebraic processes, for example, encountered by people in their ordinary business. Some courses in "consumer mathematics" are thus predicated. It is the opinion of this writer that instances of overt employment of mathematical skills by no means exhaust the possible contributions of mathematics to democratic citizenship. Consumer transactions are not the whole of living. And, even in this field, new needs may arise at any moment. A broader base for truly critical evaluation of subject-matter must be sought.

It seems well, also, at this stage to lay any reader-haunting ghosts of "scholarship" and "formal discipline" as applicable to mathematics instruction in junior college. There may be those who would appeal to the Caesar of scholarship to avoid instant judgment by suspect critics. But to seek justice at that remote source only confuses the issue, which is the place of mathematics instruction in American junior college education, and, perhaps, postpones the verdict which must be rendered finally by the public which supports secondary education.

[1] "State Higher Education in California," Report of the Carnegie Foundation, Recommendations of the Committee of Seven, pages 18-19.
[2] *Ibid.*, page 34.

A plea for scholarship, as a resort for teachers dismayed by unpleasant interrogations, must be ultimately as precarious as the refuge of Dr. Johnson's anti-social individual in patriotism. There is little excuse to evade the responsibilities of mathematics toward society, or to put its rightful merits in jeopardy before the court of public opinion. Neither will claims for or against formal discipline be argued here. The conception underlying this article, that there is a mathematical aspect to social patterns in whatever department of living one looks, implies that transfer of training is really insight, or the organization of experience (because of its inherent unity) into instances of similar response to situations fundamentally the same.

But it is one thing to proclaim a social mission for mathematics instruction in junior college, and quite another to make mathematics of genuine service to students. The instructor of mathematics must know more than mathematics. This is not to say that an educator must be equally competent in mathematics and, say, economics, or psychology, or business administration. Nor is there a mathematics for economics and another for physics. Needs for mathematics emerge with the problems of living together and of wresting power from the resources of nature. The occasions for mathematics arise through human society; the mathematical procedures required are to be sought in the interactions of the elements of social environment. Mathematics instruction is to make these patterns apparent. The instructor should be an expert consultant to advise students how to deal appropriately with quantitative data, and to encourage an infinite variety of applications suited to the interests and maturity of students. Mathematics taught in splendid isolation may be only an irksome exercise. But in the lively game of human living it is indispensable.

Mathematics and Nature

For mathematics is not a method of external control imposed upon nature, but the very character of nature itself. The spiral nebulae reveal it, and the planets in orbits about the sun. The snowflake and the diamond incarnate geometry. The leaves of plants arrange themselves about the stalk in a series noted by Fibonicci seven hundred years ago. Spiders make webs of regular polygons, and bees embody maxima and minima in honeycomb. Likewise, for all human arts and sciences, mathematics is the foundation. If sounds are to be more than a jumble of tones, the mathematics of harmony must order them into music. What are beauty and truth in art but the assemblage of planes in accordance with the mathematics of symmetry and perspective? Moreover, mathematics is inextricably woven into the fabric of daily living. Cooking recipes, balanced diets, dress patterns, and that well-groomed look are achieved through mathematics. Vegetable gardens and flowers in yards proclaim us unconscious mathematicians. The amateur telescope-maker, and the builder of airplane models, illustrate how the science serves our hobbies and avocations.

Mathematics and Social Problems

How much more is mathematics needed for our larger concerns. Social security in the final analysis is a mathematical problem. A workable program of hours and wages, of retirement and pensions, of payments and insurance, can only be established by mathematical investigation of the quantitative elements in wealth production, distribution, and consumption. The solutions for over-produc-

tion here and starvation there, limited prosperity and chronic unemployment eventually must be found through mathematics. Like democracy, mathematics permits us to make our own mistakes, but it never compromises with falsehood. Mathematics instruction thus has a peculiar responsibility for bringing the data of human experience into order and under control. It must not be so occupied with notation and with detail as to ignore the significance of its techniques for civilization.

Reappraisal of Junior College Mathematics

The time has come for a reappraisal of the topics of mathematics courses in junior college. University requirements will present no obstacle, provided the students educated in modified courses have deeper understanding and greater facility than those trained in traditional content. The geometry of the Greeks was appropriate for their needs, but the duplication of the cube has little significance for a generation that builds no altars. The calculus was invented to deal with the phenomena of planetary motion. But its applications should not continue to be confined to the tractrix and lemniscate. There are rates of change in the world today as imperative to understand as celestial motions. Empirical curves deserve consideration sometimes reserved for the center of gravity of a line.

There has been a disposition to belittle the importance of applications for mathematics. But this is the expression of relationships between individuals and groups with one another. So far from being remote from life and nature, mathematics is the way of life and nature. It speaks a universal language because it is the language of the universe. The calculus, the methods of statistics, the laws of probability, serve alike to count the atoms, to delineate the galaxy, and to outline the trend in prices. Like the Latin poet, nothing human is alien to it. The function of the junior college is to build personality, to prepare young people for full membership in society, and to develop habits and techniques for sound discriminations and correct judgments is the especial charge upon mathematics instruction.

MATHEMATICS AND GENERAL EDUCATION

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WE OFTEN HEAR the remark, "General education should be completed at the end of the college sophomore year; specialization should begin with the junior year." The University of Minnesota has developed a two-year college, "The General College," and offers a battery of thirty courses to those who wish to round out their formal education by going into life activities without further schooling. The distinguished men who compiled the Report on Higher Education in California emphasized general education by the statement that "under the California system of education tax supported, general education ends at the close of the sophomore year or the junior college." After an investigation of what is thought about general education, it would seem that it consists of that training which is necessary for every adult citizen to possess in order to meet his everyday needs. It is with this viewpoint that the place of mathmetics in general education should be approached.

General education is an expression that has been used to describe what some believe all students should receive before discontinuance of their formal training in school, or what the students, who continue with their schooling, should master before specializing in their chosen fields. Mathematics and general education should be considered with the two-fold viewpoint,—for those who specialize in many lines of work; in agriculture, astronomy, commerce, engineering, physical sciences—must secure general training, plus a certain degree of mastery in mathematics, before specialization can meet with success.

The vast majority of citizens will not specialize in any type of work that calls for much training in mathematics. With reference to their general welfare, certain questions arise: Should they be required to study mathematics at all? If they should be required to study it, how much should be required? What should be the content? Why should any be required?

Mathematics and College Success

It is not my purpose to discuss this topic, which has been assigned me, from the viewpoint of admission to the University; it should be said in passing, however, that experience has shown that two to four years of mathematics *well taught* provide excellent training to do the sort of work the University requires. Many avenues within the University are closed to those who have not had elementary training in mathematics, while ability to do well two to four years of high school mathematics has proved to be a good and predictive criterion for admission to the higher institution. Without the equivalent of from two to four years of high school work in this subject, students are unable to pursue the study of commerce, engineering, agriculture in its higher levels, and the physical sciences. But it should be remembered that Dr. E. R. Hedrick's warning is sound when he points out that "it is quite common to whitewash and accept (for college entrance, say) courses in geometry that are purely memory exercises, courses in algebra that contain no

training in quantitative thinking."* It is certain that those who specialize in higher institutions in many fields should have some training in mathematics.

Mathematics and Successful Living

For all others—perhaps 90 per cent of men and women—a limited amount of mathematics is essential to human well being. Men, women, and children spend a portion of their time in buying, in selling, in borrowing, in loaning, in investing, and in figuring out ways and means of getting along. In all of these transactions their efforts will be facilitated by training to mastery in certain phases of mathematics. Advanced mathematics, however, is for the specialist; but it also may be for the one that regards it is an avocation wherein he seeks pleasure in working intricate problems, just as one plays solitaire, or another plays with pawn and knight and castle on the chess board. As Plato said, "Let no one ignorant of geometry enter here," so those who would be best prepared to enter their chosen activities of life should not be ignorant of certain phases of elementary mathematics.

Just as a matter of self defense, every citizen should be proficient in that basic field of mathematics—arithmetic. Most of our mathematical relationships involve the fundamental processes—decimals, percentage, and measurement. Every bill should be checked before the citizen pays; this involves merely the fundamental processes, and everyone should become proficient in them. It is the experience of most people that they either pay interest or receive interest most of their lives—the first being the most usual experience. It follows that general education should insure training in figuring interest, both simple and compound. The banker uses his tables, but the layman must resort to pencil and pad. It is not out of place here to consider installment buying. It is not my purpose to condemn it; but it is held that every citizen should know enough mathematics so that he can figure the actual rate of interest that he will pay when he buys a car, a radio, a washing machine, a typewriter, a sewing machine, on the basis of a down payment and a succession of deferred payments. Here is an opportunity for the application of algebra in general education. The Annuities formula can be used and the problem worked. While this comes in the second course in algebra, the students of a class in general mathematics can be trained to use this formula. As a matter of personal experience, the only convincing argument advanced against the use of tobacco by adolescents (in accordance with the requirements of the California School Code) was the argument of of the Annuities Formula: Amount equals $PR^{n/t}$. $A=PR^{n/t}$.

Value of Quantitative Thinking

It is not an uncommon experience to hear anathemas pronounced against mathematics—but are these based upon careful investigations or prejudice? General success depends somewhat upon ability to think clearly about "quantitative situations." The study of mathematics can be so presented as to train individuals in "quantitative thinking." This sort of thinking is valuable for all citizens. One of the objectives in education is to train youth to make correct decisions; mathematics is an aid here. Students with mathematics training are slow to accept prejudiced viewpoints; they

*"Desirable Coöperation Between Educationists and Mathematicians," Professor E. R. Hedrick, in *School and Society*, Vol. 36, No. 938.

are inclined to weigh carefully before deciding; they are not prone to take snap judgment, or accept misguided statements. An illustration will set forth the argument: Recently a speaker, in referring to the colleges and universities of the present, said, "It is reported that 90 per cent of the young people who attend college and university lose their faith." If he had thought quantitatively he could not have made such a statement without a careful investigation—an investigation he had no intention of making. Training in "quantitative thinking" is helpful in understanding certain branches of economics; accounting and the mathematics of finance are helpful to the head of a family. "What householder does not first make a reckoning, before he build a tower, whether or not he hath wherewithal to complete the building."

It is not out of place to mention the importance of understanding graphical portrayal of facts. Students who are trained in mathematics in the use of the graph are better prepared to understand much of the current literature which presents business conditions of the present.

Life experiences abound in illustrations where some knowledge of mathematics make such experiences more easily understood and appreciated. Observe the construction of the great bridge connecting San Francisco with the East Bay Cities! Geometric forms stand out—the triangle, the quadrilateral with its diagonals: These are not merely for symmetry and beauty, but, on mathematical principles, they provide the necessary strength that will insure the protection of travelers for generations to come. The student who learns to think accurately in mathematics has also received much more help in analyzing the problems of life and in presenting clearly to others his proofs and conclusions. A knowledge of this subject will help students to interpret the social and economic problems of the day. Let me repeat that it is my judgment that students should not be kept in the dark about the values that may accrue to them through the study of mathematics. It would seem reasonable that less emphasis should be placed upon the abandonment of the teaching of the subject and more emphasis upon better teaching, relating the subject to life, to other subjects in the curriculum, to art, to construction, to graphical interpretation, to quantitative thinking, to a greater recognition of the Infinite, and to creative thinking.

The Joy of Achievement

Any consideration of mathematics and general education should include a recognition of the character values to be obtained through a study of the subject. Assuming that students will meet difficulty and intricate problems as they pursue their study, is it not worth something for them to concentrate on the problems and stay with them until they are solved? The significant part of the incident of Jacob's struggling all night with the angel is the fact that he said to his adversary: "I will not leave thee until thou bless me." Students who put that kind of a spirit into their study of mathematics will derive untold benefits by conquering their problems. There is getting to be altogether too much of an attitude to abandon courses on both the high school and college levels because students "find them too hard." Students later in life will meet their most difficult problems. Why not direct them toward getting experiences during their school life with difficult problems? It is claimed that students have no interest in

elementary algebra or geometry, or even in arithmetic; then why should they be bothered with them? It should be observed that many students should delay their taking elementary mathematics until a time of greater maturity; some should perhaps never take the subjects as presented to most classes; new courses in general and applied mathematics should be developed for those not going into higher institutions, and the content of such courses should be related to life experiences, thereby making possible the interesting of all normal students. When the subject is unfolded through art and architecture, in Parthenon and Capitol, in field and the far stretches of the horizon, and finally in the business relationships of life—it is then clothed with interest—"a consummation devoutly to be wished."

ADEQUATE TRAINING OF TEACHERS OF MATHEMATICS

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THE DISCUSSION of the above topic has received very little attention in the United States during recent years. Bare manipulaitve skills of high school algebra and the memoriter methods of teaching plane geometry are so very simple that the task of teaching these subjects to the pupils has been entrusted by the school administrator to the English teacher, the history teacher, and often to the athletic coach. That "Anyone can teach mathematics" is accepted all too frequently as a general principle in making the schedule. Of course, this practice is often forced upon the administration of the small high school, but the fact remains that it is much too common in the larger schools where it need not be used. The present unemployment situation in the teaching profession, coupled with the prodigious output of the teachers' colleges and the universities, leave little excuse for the existence of this defect in the assignment of faculty personnel.

The effects of permitting unskilled teachers to fill the staff positions of mathematics departments are both numerous and deplorable. One of the worst results is the woeful ignorance of high school pupils who have been forced to accept drill in technique and content memorization as the contribution and significance of mathmeatics. Many a youngster has, no doubt, viewed with amazement and complete lack of understanding the tree of knowledge at the World's Fair, which depicts mathmematics as the root of the tree. Not a few of these same boys and girls will go through life with a positive dislike of algebra and geometry because their contact with these subjects was directed by unsympathetic and inadequately trained teachers. The attitude of many students has, indeed, undergone an "about-face" during this generation. On every hand we find people who say "I hated algebra," and "I simply could not learn geometry." This was not the state of aaffirs twenty-five years ago. It is obvious to those who studied the matter at first hand that much of this change in attitude is to be credited to faulty teaching by teachers who are inadequately informed in the content of mathematics and unaware of its interesting applications.

Perhaps the most glaring effect of

the practice described in the opening paragraph of this article is the recent tendency to minimize the place of mathematics in the secondary school curriculum. This reduction in the allotment of time given to mathematics is not a reasoned outgrowth of the current elevation of the social science phase of education. The research worker in economics and social science feels the need of mathematics as keenly as the research worker in the physical and biological sciences. Even the undergraduate major in the several social-science fields must acquire a working knowledge of statistical methods. Last, and most important of all, the thinking citizen of today must have a greater familiarity with formula, graphs, and functional relationships than ever before in the history of civilization. Responsibility for the frequently expressed statement of lack of interest in high school mathematics certainly does not fall upon the writers of the textbooks, because they have kept abreast of the times and offer material of definite cultural and social value.

In the light of these evident facts, why are the curriculum experts giving a lesser emphasis to mathematics than it has received in the past?

The answer is this—mathematics, as it is taught today in many of our high schools, does not deserve a high degree of emphasis.

The remedy lies in the hands of the administrator, in the selection of teachers, and in the equipment of the teachers themselves, in acquiring the proper background and training for their work. Teacher-training institutions are performing useful service in the latter connection. As a matter of fact, they are turning out a better product each year, and seem to be keenly aware of the condition as it exists.

In the May, 1935, issue of *The American Mathematical Monthly* appeared a "Report on the Training of Teachers of Mathematics," prepared by ten of the leaders in mathematics in this country. This report is illuminating and challenging. Although it is recommended that those interested should read the report *in toto*, a few of its items are mentioned below.

In substance, the report recommends that the well-trained teacher of mathematics will have had courses in the following subjects: college algebra, trigonometry, analytical geometry, differential calculus, integral calculus, synthetic Euclidean geometry, theory of equations, history of mathematics, advanced calculus, differential equations, projective or solid analytic geometry, and modern higher algebra. In addition to these purely mathematical subjects, the following related subjects are suggested: physics and two other sciences, mathematics of investment, economics, statistics, and astronomy. Adequate training should be taken in English composition, languages, literature, fine arts, and the social sciences, to provide cultural training necessary to all teachers as equipment for their life in the community in which they labor. Last, but by no means least, the well-trained teacher will have had practice teaching in secondary mathematics, guided by a competent educator, as well as the usual courses in education psychology, history of education, adolescent psychology, educational measurements, and so forth.

The preparation and employment of teachers with this training, and resourceful personality, will go far toward restoring success in the teaching of mathematics.

A GRAPHIC HISTORY OF STATE AID FOR DISTRICT JUNIOR COLLEGES IN CALIFORNIA

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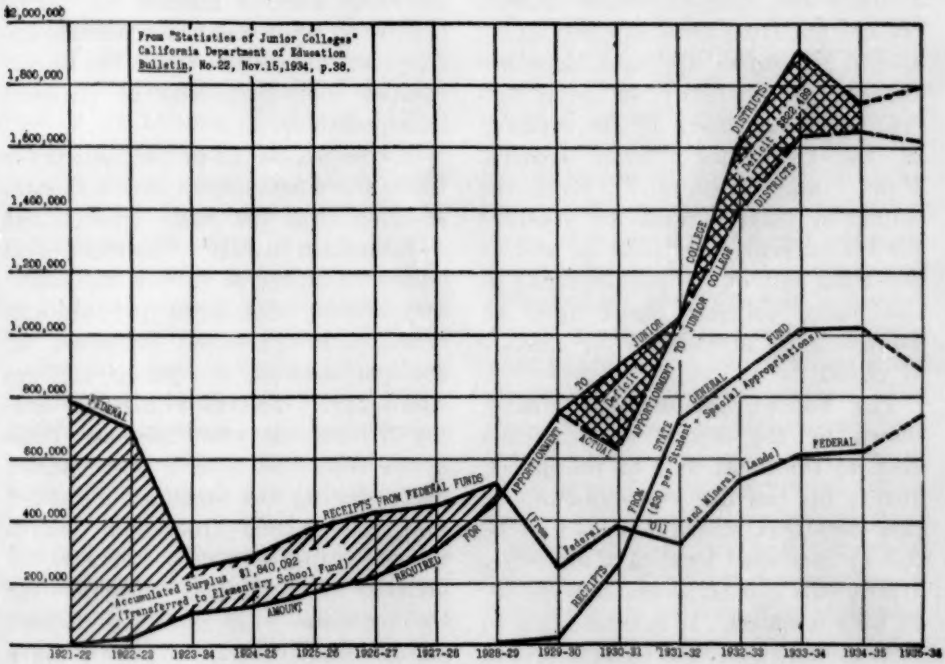
FLUCTUATIONS in the amount and distribution of the funds for state support of district junior colleges in California since their organization in 1921 can best be exhibited compactly and clearly in graphic form. This is done on the accompanying figure, the data for all years except 1935-36 being taken from the latest bulletin of the State Department of Education giving statistics on junior colleges.

The money provided to meet this need came originally from leases on federal oil and mineral lands in the state. As shown on the graph, the income from this source has varied widely, from a maximum of almost $800,000 to a minimum of only a little more than a quarter of that amount. The differences in these two funds, federal and junior college requirements, is shown by the single cross-



The line which starts at zero in 1921-22 and reaches a maximum of almost two million dollars in 1933-34 shows each year the "Amount Required for Apportionment to Junior College Districts" on the basis of $2,000 for each institution and $100 per student in average daily attendance the previous year.

hatched area on the left half of the graph. The accumulated surplus between 1921-22 and 1928-29, amounting to almost two million dollars, was transferred in annual installments, according to law, to the State Elementary School Fund.

After 1928-29, it will be noted that the two lines cross, the surplus van-

ishes, and the line showing the junior college requirements continues to rise more rapidly than in the earlier years, while the federal funds, although increasing gradually from their low point in 1929-30, have proved less and less adequate to meet the demand for which, for the first eight years, they were more than sufficient. Although supplemented by the state provision for making up the deficiency up to $30 per student, and later by extensive special biennial appropriations, there has been only one year since 1929-30 in which the full amount provided by the School Code for junior college support on the part of the state was actually met, 1931-32. Since 1930-31 the amount from these supplementary special legislative appropriations has exceeded the amount provided by federal funds, as shown by the crossing of the two lines, "State General Fund" and "Federal." Even the estimated federal funds of $744,000 for the current year, 1935-36, will be less than half of the requirements of the junior colleges, based upon an average daily attendance for 1934-35 of 17,697.

The total accumulated deficit, shown by the double cross-hatched area on the right half of the graph, during the last five years amounts to over $800,000, which has had to be met by increased local taxation or by drastic cuts in salaries and services, or by both methods. It is interesting to observe that this total deficit is less than half of what the surplus for the first eight years would have amounted to, had it been possible to accumulate the annual surpluses and keep them, even without interest, for subsequent enlarged demands upon the junior college fund.

The last legislature, in the passage of Senate Bill No. 984, provided that in case the federal funds proved to be insufficient in any year, as undoubtedly they will continue to be, the balance up to $90 per student (instead of the statutory $100) in average daily attendance, shall be made up from the General Fund of the state. While this is not as much, theoretically, as formerly, it has the great advantage of assurance and stability in that it substitutes a permament method with a definitely assured amount instead of depending upon recurring biennial appropriations, subject to all the uncertainties and exigencies of political manipulation.

The points on the graph plotted for 1935-36 are based upon close estimates received from the State Department of Education in July. The theoretical amount required to furnish the statutory $2000 and $100 per student amounts to $1,803,700; instead, at $90 per student, the junior colleges will actually reecive $1,626,730 during the current year, 1935-36. Estimates from the federal government, made during the summer, indicated that the income from that source would be approximately $744,000, an increase of more than $100,000 over the previous year and the highest amount since 1921-22. This will leave about $880,000 to be transferred from the state General Fund to the district junior college fund.

WHAT IS HAPPENING TO THE CURRICULUM OF THE LOS ANGELES SECONDARY SCHOOLS

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THESE are days of significant—and sometimes painful—transition and readjustment in educational procedures. The teaching field, along with every other phase of living today, is being challanged; and the response of teachers and administrators must be effective, or education will be a negative influence in the society of tomorrow. To quote Robert Briffault, "Many of us will have largely to learn our crafts anew."

Nowhere is this challange of modern society being recognized more fully than in the rebuilding of the curriculum of the secondary schools. This is one of the most compelling facts in educational progress today. Just how radical these changes in the instructional program, and how adequately are the many adjustments meeting the present day demands, and the new, broader educational outlook?

Partial answers to these, and other similar, questions which are being asked by educators and laymen today may be found in a recent survey of instructional trends and developments in Los Angeles, undertaken by the Council of Directors and Supervisors of that city's school system.[1] A brief review of some of the more important of these will give a fairly clear idea as to the direction in which the curriculum is moving in one city.

No attempt will be made to point out the many reasons for the various departures from more traditional procedures. Sufficient to state that of the numerous influences, these, particularly, are significant: A growing realization of the close relationship between our schools and the changing, complex, and canfused social and economic world of today; a general feeling that educational procedures that served us fairly well in the past are not adapted to schooling needs of today; and the rather wide acceptance of the newer, more dynamic, concepts as to the true nature of the learning process. Coupled with these major influences has been a wider emphasis on the social viewpoint in all phases of school life. This has meant a recognition of the fact that the social should come before the individual, that the human being is, primarily, a social being, and that the increased cultivation and expression of social purposes is essential to the preservation and advancement of civilization. Beyond this, it is not easy to ascertain exactly what is at the root of the many great changes in the teaching program. We know there are some influences which cannot be put under the microscope, but it is evident on every hand that a combination of social and educational forces is resulting in a new concept of the curriculum, which is slowly transforming every activity in the schools.

In the field of English and other social studies, there is a noticeable trend toward a unified course including related science, art, and music. This program has been tentatively developed for grades seven to eleven. Both the single and double period approach is used. The primary emphasis is on social and cultural studies, dealing with ever widening spheres of interest at the elementary

[1] Liberalizing the Curriculum of the Los Angeles City Schools. Report of the Council of Directors and Supervisors, Los Angeles City School District, June, 1935.

level; the development of the narrative story of America in grades seven and eight; life and culture of other peoples, past and present, in grades nine and ten; and problems of contemporary America in grade eleven. This program is designed, primarily, to develop those social and civic qualities which should be common attributes of all pupils.

In English, as a separate subject, there is manlfest an increasing emphasis on creative work in oral and written composition, training in correct usage, and a more extensive attention to contemporary literature of America and other nations of the modern world. This has been accompanied by a greatly decreased amount of drill in formal grammar, and a less intensive study of the "classics."

There can be noted, in the social studies, an increased emphasis upon contemporary problems, and a fusing of materials from history, geography, civics, and sociology, wherever needed. Except for specialized electives, all work in this field is designated as social studies. No separate social sciences are taught. This field, more than any other, has undergone drastic change and revision, and gives promise of offering that common cultural and social experience desired, at both the elementary and secondary levels.

In the field of science, there is a noticeable shift of emphasis from the producer's science to that of the consumer. It is hoped that, with this change, the science program can be placed on a more functional basis with a decreasing emphasis upon the traditional college preparatory subject content. A continuous three year program for the junior high school has been developed with the seventh year work being planned in collaboration with the industrial arts. There is, also, some experimenting now taking place with a general "Physical Science" course for grades eleven and twelve. In the related field of mathematics, there has been considerable pruning above the eighth year. Under consideration is the development of a tenth year applied mathematics course, and a reduction of the required senior high school courses.

Greater stress is being placed, in commercial education, upon the personal uses of general business information and simple commercial skills. Among the new developments in this field are the following:

a. Everyday Business, a course which aims to give the pupil an opportunity to acquire business information and a knowledge of business forms and customs.
b. Shorthand for Personal Use, an experimental course for non-vocational pupils.
c. Record Keeping for Personal Use, a contemplated experimental course, to include all kinds of home and organization records.

The general aims in this subject are being directed more toward giving pupils a better insight into business and economic conditions, rather than providing a highly specialized commercial training.

Art and music in the Los Angeles city schools are making increasing contributions to the basic social and cultural orientation program, as well as furthering their own unique educational contributions. The enriched social studies treatment makes many demands upon art and music teachers. In several of the schools, some of these teachers give their entire time to aiding and furthering the program of cultural studies. Apart from this contribution to the basic course, there has been a decided change in emphasis from the reproductive to the more creative type of experiences in the art program. Every effort is made to develop de-

sirable art habits and attitudes through pupil choice of art interest, discussion of art experiences, acquaintance with available art mediums, production in clay, water color, calcimine, and charcoal; and the enjoyment of art through appreciative and creative endeavor.

In teaching music, every effort has been made to provide increasing opportunities for self-expression and preparation for participation in the musical life of the community. Further, there has been a growing interest in a Cappella singing; superior instrumental talent is being recognized and featured through the maintenance of All-City instrumental groups; and every effort is being made to center attention upon intelligent appreciation of the music that surrounds the pupil in his everyday life, including radio offerings, concerts, and other community musical events.

In the industrial arts, there is a noticeable decline in specialized training in the more technical trades. This training is being relegated to the junior college and trade schools. There is an increasing emphasis on training for the worthy use of leisure time; a closer relation is being made between industrial, scientific, and cultural studies; and more attention is being given to instruction in simple household repairs and adjustments. Looking at the field broadly, we see a greater amount of training for intelligent consumption of goods and services, and a postponement of strictly vocational training to higher grades and specialized schools.

Apart from the developments in the separate fields of learning, there are certain manifest trends of a general nature which can be noted in practically every part of the instructional program. They include:

1. A shifting of emphasis from learning, as a passive process of absorbing prearranged and prescribed subject-matter, into a much more active process, in which the pupil is an active participant in the planning and developing of each unit, as well as in the learning activities.
2. The fusion of compatible subject fields and materials, by removing some of the traditional department "fences," such as between English and social studies.
3. A greatly increasing emphasis on the adaptation of teaching to individual differences of ability and interest.
4. An increasing informalization of teaching procedures, and unification of the learning activities of pupils.
5. Emphasis on subject-matter only as means to more important ends, those latter relating mainly to personality and social growth.
6. The dethroning of the sacred "single textbook," by placing more emphasis on the building up of classroom reference libraries. This includes the use of multiple sets of books, and the partial decentralization of the main library.
7. A growing realization that "how to teach" can not be considered as something apart from "what to teach."
8. Use of grades, primarily, as the balanced evaluation of the social and emotional, as well as the intellectual growth of the pupils—rather than the purely objective indication of the degree of mastery of subject-matter.

Mention should be made of the increased use of libraries to include much more general provision of reference books and library facilities in the classroom. To quote from the report, "The library function is paramount in the new program." Safety education is receiving more attention throughout the entire curriculum. Visual aids are being more extensively used in social studies, as well as in the natural and physical sciences. Physical education is developing into a broader, more integrative type of program. These fields are all making enriched contributions to the new program.

There are other developments taking place in Los Angeles, but the

above are the most significant, and should give a fairly clear idea of the trend which curriculum building is taking in this city. Besides the many changes strictly within the various fields of learning, there have been a number of general developments of considerable interest. Some progress can be noted in the freeing of the secondary schools of the city from the dominance of university requirements. Four high schools have been liberated from the usual college entrance restrictions, and are free to embark upon extensive programs of curriculum reorganization, entirely apart from the program for the rest of the schools. Further, there has been a city-wide reduction and limitation placed on the amount of home study, ranging from its complete removal from the first eight grades to its restrictions to one and one-half hours four nights a week in the senior high schools. This change, particularly, has encouraged the extensive use of the hour period in the secondary schools, with its many beneficial effects. Cutting down on home study has also resulted in increasing the emphasis on education for the worthy use of leisure time. One or two schools have established, and others are contemplating providing, one period in the school day for the voluntary pursuit and cultivation of leisure interests. A change is further to be noted in the system of marking, formal grades having been completely abolished at the elementary level, and fundamentally revised in the secondary schools.

Signs of new life are manifold in the field of education guidance. There are many evidences that use of intelligence tests, reliance on formal records and occupational guidance, are moving into a position of less importance. Increasing emphasis is being placed on the more personal types of guidance, more social relationships, and a new intimacy between counsellor and pupil and teacher and pupil, which have not, heretofore, been fully considered. These matters are only beginning to receive wide attention in the schools. There are likely to be greater changes here than in any other phase of curriculum development in the next few years. For one thing is certain: present guidance facilities are obviously inadequate. Possibly, through a core curriculum and the social studies, teachers working under the direction of counsellors or other educational leaders in the school, there will develop that personal, helpful relationship which is so necessary and so lacking at the present time.

From this summary, it is quite apparent that genuine progress has been made in liberalizing the program of studies in the Los Angeles secondary schools. The instructional pattern has progressed a long way from a rigidly departmentalized, academic college preparatory type of work, to a curriculum sensitive to the real needs and interests of the great mass of pupils, and constantly subject to adjustment to the social world of today. Many of the developments have been under way for a number of years, especially in the elementary field, and in the more practical subjects in the high schools. The academic subjects and the "classics" have lagged considerably behind. However, it is quite manifest that a program of fundamental revision is under way at present in these latter fields, which offers much promise for the immediate years ahead. Even in the most firmly entrenched fields, such as language and mathematics, there are signs of a realization of the need for transformation. These changes in the more traditional sub-

jects stand out as the most significant trend to be noted in the survey.

A warning should be given lest these new practices be misconstrued. When we say "things are happening to the curriculum," we know full well that many of the changes are more ambitious hopes than genuine realities, are more enthusiastic plans than universal practices. But it is definitely known that increasing numbers of principals and teachers are working in terms of a more functional curriculum, and are translating the new concepts into vital classroom experiences. To realize this fully, one needs simply to observe the learning activities taking place in some of the more progressive classrooms of the city. Such direct observation reveals fundamental changes which a survey can never show.

Naturally, there are some who stoutly resist these innovations, knowing, as we all do, that there are many pitfalls and difficulties which will have to be overcome. Lack of new materials, teachers untrained in new procedures, poorly organized units of work, lack of clarified objectives—these, and other obstacles, stand in the way. But, in the eyes of those truly interested in the welfare of pupils in the schools, these drawbacks are far less serious than the weaknesses of the subject-centered, traditional curriculum. The many teachers who are thinking and working in terms of this newer, more creative, program are too convinced of its soundness to turn back. This conviction is largely a result of the increased interest and pleasure which pupils now find in their school work. When we find increasing numbers of pupils happily and purposefully engaged in learning activities, we cannot doubt the wisdom of the new approach.

Even allowing for the confusion attendant upon great changes, they recognize as an uncontrovertible fact that the individual pupil is receiving more attention, his interests, needs, and aptitudes are gaining more consideration, and he is learning to live a fuller and more socially useful life than ever was possible under the older procedures.

As for future trends indicated in the report, there is some evidence that we can anticipate further progress and expansion in the direction of a basic core curriculum, centering in the social studies and the arts of communication and expression. We can look for an enriched, enlarged, guidance program, with more emphasis on personal relationships. We can expect the secondary field to become as liberalized as the elementary, and as freed from the dominance of college preparatory requirements. We can hope for a much greater emphasis on training for social life, leisure interests, and other avocational pursuits. We can look for a further decline in the immediate occupational emphasis in the secondary schools, and, finally, we may anticipate that every part of the curriculum of our high schools will become and remain more keenly attuned to the needs of each particular child and the social world of which he is likely to become a part.

AN EXPERIMENT IN CONFERENCE READING

MARY NOE FOUNTAIN
English Department, Chico High School

I HAD just finished one quarter's work in my 3A classes when the principal asked me to try a plan for teaching appreciation of literature through the Conference Reading way. I had given to each of these classes one of the best units I think I have ever made out for a study of *The Idylls of the King,* taught in the usual way of reading certain idylls with the class, calling for discussion of some passages, memorizing choice lines, illustrating scenes, and of making local and personal adaptations of situations in the *Idylls.* The result seemed fairly satisfactory; yet I couldn't claim one hundred per cent enjoyment by all of the students, a condition eternally h o p e d for by any teacher who loves these *Idylls* as I do. I suppose there were even the traditional few for whom I may have wrecked forever their interest in the *Idylls* because of my method, presentation, or something I said, or forced them to do, contrary to their sense of justice or of appreciation. At any rate, I was ready for any adventure in the teaching of literature that promised to arouse students' sincere and genuine feeling for their reading.

Personnel of Experimental Class

The class that seemed the best one for the experiment was one of little unity. There were twenty-two in number with an equal number of interests. To give you an idea of the personnel of the class, I shall describe the outstanding ones to you. There was one girl who had been a discipline case for one of the counselors the previous year; one boy was a problem case in a special reading class we maintain; another boy was so nervous that when I had him in my class the previous year, I could hardly tolerate his inability to stay in his place long enough to accomplish anything; three girls were the silly, giggly type, out of whom I had almost given up hope of ever getting anything worth-while; another girl would show sparkling ability in some lines, and then would sag into the most commonplace type of work. Her attitude was so aloof that I could never get close enough to find out anything about her. Even the Dean of Girls said she could not understand her. Another boy had been a consistent failure in English and, as a result, was highly indifferent to any appeal. Then there were the ever-present clown, the irregular attendant, the ones who hear no English spoken in their homes, and about three who never read anything unless required. Otherwise the class was normal.

Nature of Pretest

Before saying anything to the class about the plans for the new reading adventure, I passed out sheets of paper and asked the students to number the answers I was about to ask them to make to my questions. Then, in the shortest form of answers, they wrote their individual replies to the following questionnaire:

1. Think over the books you have read during the last two years for outside reading. What three books have you enjoyed the most?
2. Classify them as to type: adventure; biography; fiction - romance; fiction-travel; scientific discovery; nature: animal, plant, etc.; drama; mystery; poetry.
3. When you have chosen a book for

your pleasure reading, what did you read? If you can't think of the title, classify it similarly to the above classification.

4. Indicate by *yes* or *no* whether you would enjoy reading aloud in a group a play, a dramatic poem, or a story.
5. Name any book you have enjoyed that you could bring from home to lend to others in this class.
6. How long does it usually take you to read an ordinary fiction book of 350 pages?
7. Indicate by *yes* or *no* if you would enjoy talking over a book with a friend.
8. Indicate by *yes* or *no* if you would like the director of reading to help you select the type of book you would like to read.
9. Indicate by *yes* or *no* if you read just one type of book.
10. Indicate by *yes* or *no* if you would like to improve your range of reading.
11. Indicate by *yes* or *no* if you can see any value for yourself in this reading unit. Explain your answer.
12. What magazines coming into your home do you read?
13. What kind of books do your parents read? Any that they deny you?

Results of Pretest Summarized

The answers that came to these questions gave me what I wanted to know about the individual students. In summarizing the results, I found that there was a lack of reading experience in the lives of these students; there was a willingness on the part of everyone to be helped in the selection of his book; only two disliked talking over books; only three enjoyed reading aloud together; one student definitely preferred non-fiction; the others leaned heavily to fiction-romance and adventure in fiction; three could bring books to lend; many replied that they owned no books; there was little or no reading of any stable value done by the parents at home. One girl confided to me that her parents had read all the best books and had nothing left now to read. One boy wrote, "My parents can't read; so they don't." Another boy said that his parents didn't like for him to read anything unfit; otherwise they never denied him anything they read. The class, as a whole, were allowed to read anything the parents read.

Plan for Reading Presented To Class

With the situation above revealed to me, I presented to the class the plan for our next quarter's work. I told the class we were going to read in this class for the next nine weeks. But we were not going to read on the same plan as we had formerly. Now they were to get credit for reading what they liked to read. They were to make their own selections from books in our school library, from their own libraries, or from any source they had. We would promote an atmosphere of ease, relaxed comfort, and enjoyment in our classroom as far as our facilities would permit. The idea was to enjoy reading, and anything we could do in that hour to bring about our enjoyment was what we were after. I told them of students in other schools who read like this, and I thought they would like to try the method also. For once, all agreed they thought it would be fun to read in this way. Accordingly, the next period of class meeting each one came with a book of his own choice.

The principal had warned me not to be shocked if someone came in with *Diamond Dick*, and while I was expecting almost anything, I was agreeably surprised to find that the first choice of books was not flagrantly objectionable, even though some of them were insipid and lacking in any real literary value. In fact, there were some of real merit.

Teacher Activity

I had a little talk with each of the readers during the next few days. I roamed about from one to another finding out his selection and the reason for his choice. This information I chronicled on the back of his pretest sheet, keeping the record by dates. Then, when each student finished his book, he came to me for a slip to the library to make an exchange of books. At that time I asked him some questions about his book—what he liked about it; if he thought he had learned anything he didn't know before; if he thought he would remember any of the characters as examples of people he might meet in his own life; if there were any good descriptions he cared to remember, etc.; if he would recommend the book.

For the first few books that were read I had to drag out the answers to my questions; but after that, the students seemed eager to talk about their books, especially when they found that I had read them, too. Sometimes their questions to me were as searching as mine were to them. But I'm getting a little ahead of my story.

Group Activity

After we had been reading for a week, I called the group together for discussion. All week the informality of the room had been apparent in tilted chairs, feet stretched out on a chair in front, collections of friendly groups who liked to share with a sympathetic friend a humorous passage, a good picture, or some clever dialogue. Now we grouped ourselves about one long table in the room while each one related his experiences of reading. All had read one book by that time with the exception of the one boy who was a case reader, and even he had read far enough in his book to make some contribution to the discussion; some had read two and three books by that time.

Result of Group Discussion

The result of the discussion was immediately noticeable in the demand for some of the books favorably reported on. I noticed, for instance, that *Patricia Brent, Spinster,* went the rounds among the girls. But the interesting thing to see about this harmless, but meritless, book was that by the time it reached some of the girls, they had read others of better standard, and, as one girl then said, "I have read better books than this, and I don't enjoy anything quite so light as this now." And this comment came from one of those girls I have characterized as silly, giggly, hopeless.

Records of Student Reading

It was a great incentive to watch the progress of these students in their enjoyment of reading. Religiously I recorded the books read, with the reader's reactions. Sometimes I summarized what the student told me; sometimes I quoted his exact words. I'll copy the record of the girl whom neither I nor the Dean of Girls was able to understand.

March 6—Grove, *The Mystery of the Sandalwood Boxes*
Borrowed it from some of the class members. Not at all enthusiastic. Couldn't get much response from her.

March 9—De Kruif, *Men Against Death*
Borrowed from school library; curious about the book since she had heard of it. Browsed through it and was attracted by some of the sentences. Not enthusiastic when finished.

March 10—Wescott, *David Harum*
Selected it after the director's display of some of the library books. The coming attraction of Will Rogers in the play made the reading seem desirable. She liked the book fairly well. "There are some good characterizations, but there is too much horse trading in it for me."

March 26—Stoddard, *Lectures: Southern California, Yosemite, etc.*
Wanted non-fiction. Enjoyed the travel kind.

April 4—Conrad, *Typhoon*
Didn't like the story because it was tediously written. "It took too long for him to tell about the storm. I think it is good as far as that kind goes."

April 12—Tennyson, *Enoch Arden*
Recommended by director when she said she would like to read some poetry and had read and enjoyed some of Tennyson. She thought the story was dramatic and entirely in keeping with sea life. She thought she was made to do a great deal of thinking about Annie, Phillip, the children, the home, and Enoch. She read of similar occurrences in real life. She loved the poetry. It never got in the way of the story. In fact, she prefers stories told in poetry. The pictures are always better. Nothing in poetry is written unnecessarily. She keeps a scrap-book of the poems she enjoys most.

April 14—R. Browning, *Pippa Passes*
Suggested by the director, who told her something of the story or plan of the poem before she read it. In talking over the poem, she was asked the question what she thought it was that had made all of that change come into the lives of the persons represented in the poem. She said, "I think it was the simplicity and wholehearted sincerity of Pippa's song that brought the healing to all those people."
(Note: After she made this statement, I couldn't ask her another question. We just looked into each other's eyes and smiled. We understood. We have known each other ever since. That common bond of feeling the same way about Pippa's song has done the trick.)
The next day she reported having read a magazine story, carrying the same message as this poem. She volunteered she had understood the story and had got much more enjoyment from it after having read the poem.

April 20—Took out the volume of Tennyson's poems. Read *The Princess.* She had read the *Bugle Song* when she was in the fifth grade. She loved the sounds and the pictures called up in that poem. Ever since the fifth grade she has loved the poem and loved to dwell on the sounds and pictures. She didn't think the rest of the poem was as pleasant to read as the beautiful songs. She did enjoy all of the songs from *The Princess.*

April 21—Gordon King, *Collection of Verse*
She enjoyed the poems and considered them the best collection she has ever read. She is copying some of the poems from this collection into her scrap-book. Usually she finds only a few poems in each collection she really likes, but in this one she has found many.

April 27—Philip Gibbs, *The Cross of Peace*
"A story of war and of current conditions told by the man who knows so much about the war. The factual material is dressed up and made extremely readable by a thread of romance." She recommends the book to anyone who doesn't demand a quick-moving plot.

May 2—Hart, *The Bellamy Trial*
About the only appeal it has made to her is the clever way of presenting court procedures.

May 9—Oppenheim, *The Curious Quest*
A good story, not especially deep nor especially outstanding. Good of its kind. The plot is interestingly worked out.

May 10—Loring, *Swift Waters*
Ordinary fiction. Entertaining, but nothing unusual.

May 29—Browning, *The Ring and the Book*
Unfinished when school closed. She was enjoying the rhythm and the beauty in the Italian names.

Each record was different, of course. I wish I could show you others, so that you might get a better idea of what the average reading of the class was like. I may tell you truthfully that while no one else in the group chose to read poetry, there is just as interesting development in taste and in judgment revealed in every record. Considering the low level of reading that this class began with, I have every reason to think the nine weeks of Conference Reading was profitably spent.

I feel sure there are those teachers of English, who, if they could look over my records, would say, "I don't see any great achievement here. I don't see that these students demand or grow into reading Shakespeare." My answer to a criticism of that kind is, "No, by actual choice none of this class chose to read Shakespeare; and if I had tried to make him read

Shakespeare as I did *The Idylls of the King,* I should have met with the same uninterested results." The students in this experimental class had read what they were capable of understanding and enjoying, and the building of sound, worth-while enjoyment was the sole purpose of the unit in reading.

When I took counsel with myself to see how I felt about the course and what the students had actually got out of the experiment, I found the following items prominent characteristics of the reading periods:

1. There was no resentment to overcome about the student's book. If he found he had made a mistake in his choice, he was free to change books.
2. There was no lagging on the part of the students, nor was there need for any prodding on my part. The room was always a model of industrious reading. Never did anyone complain. The students always seemed eager to proceed with their reading.
3. There was no discipline problem. The class clown was too busy with reading something he liked to entertain.
4. Each student grew in enjoyment of discussing his books with me and with his classmates.
5. The first feeling of defense for his selection of a book gave way to a frank statement, backed by intelligent reasons for his opinions. I feel we reached common ground in understanding.
6. Positive evidence in judgment of books developed. It was interesting to me to see a student read something good and then turn to lighter books, only to return to the better reading again. (The above record is a case.)

Personally, I feel that to have reached the place of agreement and understanding that I did with this class was worth more to them than any study I could superimpose upon them.

I think, however, there were times when I could have moulded the thoughts of some of those students into a demand for a class study of some one classic. There would not have been the resentment to break down on the part of some before the students could read a classic. Undoubtedly, there would have been a better background for appreciation.

Planned Objectives

I did not ask the class to formulate any objectives for the course until they had been reading for about two weeks. During this time we had two class discussions, attention called to numerous book reviews by different authors, one book display, and one period in which I had read to them some selections from *The Pickwick Papers* in an effort to promote interest in the Dickensian humor. After these various experiences, I thought the time had come for the class to formulate some definite goals they wished to achieve in their pleasure reading. For this purpose I issued 4x6 cards to each member, and asked him to write as briefly as possible his one aim, or aims, he wished to gain through his reading. Then I wished him to list the books that he had read so far and that had helped him in any way to achieve his goal. On this card he was to keep the record of his reading. As an example of the cards kept by the students, I shall copy one here for you.

Name .....

Objectives:

1. To be able to be a better judge of books.
2. To become interested in books which now seem very dry.

Books read:

1. Babcock, *The Soul of Lincoln*
   This is a first-class book and very interesting. After reading poorer books, one can judge this book as first-class, easily. I read three books on Lincoln by different authors, and I think this is much more interesting than the other two.
2. Bromfield, *The Farm*
   This is much different from any I have

ever read. I had to stop sometimes and kind of think the story out. It is a first-class book.

3. *Ethan Frome* by Edith Wharton
   A wonderful character study. I learned to know his character (Ethan Frome's) from the inside — how and what he thinks.
4. Eliot, *Silas Marner*
   A character study, but I know Silas more from outside observation, reputation, and from his actions.
5. Ferber, *Cimarron*
   A good book for character; history with enough romance to keep it from being dry.

So in this simple way these 3A students learned that their reading for enjoyment might just as well be done with some definite purpose in mind. The form of the record was so simplified and abbreviated that no one ever rebelled at jotting down the books he had read that would tie in with his objective. Nor did it detract anything from his pleasure.

Student Reaction

To show that my students really enjoyed this way of reading, I want to quote statements of their own. I asked them one day to write an honest opinion of our experiment. They knew what they said would not affect their grade in any way. What they say about about this method strikes the highlights of the procedure better than I could.

"I like this kind of reading the best because you feel more like becoming interested in varieties of books, and you can go ahead with reading according to your own ideas."

"I prefer reading like this because I like to choose my own books."

"I like very much to read like this, and I think it is just as beneficial to the student. It may not teach us parts of speech, etc., but it teaches us something far more valuable. I think it is best to read this way because we may not all like to read the same book, and this way gives us our choice. It also helps a lot to talk your books over individually with the teacher."

"I would much rather read this way, but I did enjoy *The Idylls of the King*."

"I like this kind of reading better than reading classics because each thing we take up now takes less time, thereby giving us greater variety. But there is one objection to this—it is silent. I never knew anyone who could read and put as much feeling into poetry as you do. You could read poetry for me by the hour. I can feel about poetry—it moves me deeply—but I can not express my feelings in words as you do. Aside from my one objection I think we learn more this way. It gives us a more practical view of things."

"I like the present reading method much better than the class study because one book or story might not please everyone; but in our present way of reading we have a large amount of books to choose from. Also, when you read a book by yourself, you have the chance to decide whether you like the book or not. If you don't, you can always take the book back to the library and find another. Most people have a different way of reading, and in our present way you have the chance to read the way that best satisfies you."

"I like to read this way better than to read the class study way, because these books we are reading now are much more interesting. I have not found it hard to concentrate on a book of my own choice." (This statement came from my class clown.)

"I like to read the way we are reading now because you feel as if it were your own work, and you take more interest in it and enjoy it better."

Do not these testimonies tell the story? Books of their own choice, books they like, reading at their own speed and in their own way, seeing a practical value in their reading.

Student Conscious of Own Progress

These testimonies do not show the students' consciousness of their own progress, and so I should like to add just one from a girl wro dropped her U. S. history because she was so poor in reading vocabulary. She tells her own story like this:

"Before we started in class, I didn't enjoy reading at all; but after we had read for several weeks, I began to enjoy reading very much. I like to read books on travel and some on romance now, while before I only liked to read love stories. The books I

have read have broadened my vocabulary, bettered my spelling, and increased my understanding of pronunciation. I have learned about different countries and peoples from the books: *Jungle Peace* and *Spanish Towns and People;* I have read for recreation: *The Curious Quest, Barbarian Lover,* and *Visitors to Hugo;* I have broadened my range of reading through such books as: *The Rainbow Trail, Little Women, Jungle Peace, The Story of My Life;* I have read some good mystery books: *Hidden Staircase, The Barbarian Lover;* I have enjoyed several books of romance: *The Silver Bride, The Virginian, Patricia Brent, Spinster.* I have enjoyed this course very much, and I am sure that the rest of the class have, too."

I think there isn't any teacher who wouldn't get a thrill over a statement such as this. I had been more than gratified with the progress, but I was much more pleased by her own consciousness of awakened interest.

Grades. When the time came to make out the grades, on what did I base my judgment? On a written test founded on factual material? No, the choice of reading was the basis. Whenever a student showed me through his choice and through his evaluation of that book that he was progressing in his reading experience toward that goal of recognizing a good book, a goal all of us English teachers earnestly hope for, I considered that person was doing good, steady work. However much the student surpassed that point determined the A or B grade; however much he fell below that level determined the D or F grade. There were no failures in this class. There was one D grade earned by the handicapped reader and one A grade earned by the girl who got so much pleasure from Tennyson and Browning.

Teacher Satisfaction. On the whole, this has been one of the most satisfying experiences I have had in teaching English. The happy hour accounts for the greater part of that feeling. This condition was made complete because everyone was actually accomplishing what he wished without pressure of any kind. I feel that if reading had been enjoyed like this from the time the child began to read independently, the background of experience of the average high school youngster would be far beyond what it is today. It might be possible, then, to conduct more enjoyable class studies of the classics with far better results than I experienced in the first part of the term with my 3A classes.

INCREASING THE SOCIAL VALUES IN FOREIGN LANGUAGE INSTRUCTION

F. J. McCONVILLE
Principal, San Mateo High School

For at least two decades there has been much discussion in educational circles relative to the futility of the teaching of foreign languages in our secondaary schools. Much of this criticism has been ably rebutted by the teachers of foreign languages. The fact, however, still remains that many of our secondary school students have profited little, if at all, from the courses in foreign language which they have elected or, to satisfy college entrance requirements, been compelled to take.

A stock argument of the teachers of foreign languages has been that their pupils acquired a certain amount of cultural background which they could not otherwise have attained. Whether or not such background was acquired in any measurable proportions by very many students, certain it is that the belief has been prevalent among parents that the argument of the teachers was valid.

One noticeable defect in all our language classes has been that many students, who could hope to profit little from such study, have been enrolled and, despite the despair of teachers, encouraged to remain. This, of course, is due to the vicious system of competition for students under an elective system where teachers fear that decreasing numbers will tend to confirm the arguments of their critics.

That the study of a foreign language has a value for many students very few educators would nowadays deny. That there is value in such study for the majority of students in our secondary schools is questionaable. And yet, in our search for background courses on broad cultural lines suitable to the capabilities of our students, there is a wide field in which the well-trained and enthusiastic language teacher can be of immense usefulness.

The great stream of our culture flows from European sources, and, properly to understand its flow, it is necessary to have some knowledge of the life and customs, the art and history of the peoples from whom we spring.

With a feeling that we were exploring new fields of usefulness in teaching we, at San Mateo, have for the past two years been cautiously feeling our way. It may be of interest to others to know upon what basis we have planned and progressed.

We offer, at the present writing, four courses which for want of better names we designate as Italy, France, Germany, and Spain. In these courses we endeavor to give the student a conception of the life of the peoples in these countries, and the contribution which each has made to the development of western civilization.

We use no text-books, for none are available. Students are required to make their own note books. We have found that much material within the grasp of students is obtainable, and in many cases this material can be had for the asking. The varied publications of E. N. I. T., the Italian Tourist Bureau, for example, are well prepared, beautifully illustrated, and gratifyingly free from propaganda. Films leased by the Extension Division of the University are of inestimable value, and, by the expenditure of a small amount of money, a collection

of books and pictures can be acquired.

A sample outline of the topics discussed in one of these courses may be of interest. Italy is taken as the example.

1. The Geography of Italy.
   (a) Climate.
   (b) Physical characteristics.
2. Cities of Italy and their history.
   Rome, Florence, Venice, Naples, Milan, Palermo, Genoa, Turin, Assisi.
3. The Italian Language.
4. The Makers of United Italy.
   Cavour, Garibaldi, Mazzini, Gioberti.
5. The Government 1870-1915.
6. Italy and the World War.
7. Fascism.
8. Benito Mussolini.
9. Art in Italy
   Ancient, medieval, modern.
10. Painters and sculptors.
11. Italian music
    (a) Opera.
    (b) Neapolitan street songs.
12. Italian architecture.
13. Italian literature.
14. The English poets and Italy.
15. The commerce of Italy.
16. Italy's foreign policy.
17. The Italian royal family.
18. Italian scientists.
19. Italian explorers.
20. The Italian colonies.
21. Italy's influence on other peoples.

While these courses are open to all students, those enrolled in certain curricula are especially encouraged to take them. These are for the most part students who are working in the fields of Art, Home Economics, Drawing, and Music.

In the development of the course, teachers from other departments are called in for their contribution. Topics are discussed as events, and timeliness and interest from the outside aid in stimulating curiosity. The opening of the operatic season in San Francisco provides, for example, a fitting time for the discussion of Italian opera. The Italian operatic composers and their works are studied. The plots of the better-known operas are learned, together with the classic arias. The class is then turned over to a member of the music department who, with phonographic records, plays the different arias, and, at the end, by replaying certain records, gives a recognition test.

When discussing other topics, we have used teachers from the departments of Physical Education, Mechanical Drawing, Science, and Home-Making. The last named gave a talk on Italian cooking, showed samples, and gave recipes for various Italian dishes, the while demonstrating the origin of various dishes with that happily conceived and jolly publication of The Italian Tourist Bureau, "Gastronomic Italy."

This semester we have assigned a room exclusively for the use of these classes. The room is equipped with tables and chairs. The walls are decorated with pictures and posters. It has its own library and ample closet space for storing teacher's aids. There is a piano and phonograph and equipment for showing films.

The popularity of the courses is attested by the fact that we cannot accommodate all who would enroll. Those students who have taken one of the courses generally go on.

It is a virgin field where careful planning and much sifting of material is necessary. Enthusiasm will carry a teacher a long way, but broad reading and an intimate knowledge of the country are almost a *sine qua non*. It is a field for language teachers, but not all language teachers can qualify.

The novelty of it and the interest of teachers is now carrying it along. Whether it will become a permanent feature in the school is yet to be demonstrated. As the Italian proverb has it, "Chi va piano, va sanó e va lontano." That has been our method, and on it we base our hopes.

THE PROGRESS OF FUSION IN THE LONG BEACH JUNIOR HIGH SCHOOLS

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THE FUSION of subjects in the Long Beach junior high schols, during the past three years, has been in the experimental stage. Each of the seven schools involved has developed its own program and procedures, though constantly informed of the work being done in all others. This freedom of operation has resulted in a truly experimental attitude on the part of all concerned. At the same time, the constant inter-communications provided have prevented undue diversity.

The plan of tying subjects together was initiated by explaining the philosophy and purposes of fusion to all of the principals, who, in turn, developed the idea with their various faculties. The next steps in setting the plan in motion were the rebuilding of schedules, the retraining of teachers in the classrooms, and the development of working plans generally for carrying the idea into effect. All plans were set in motion only after they were thoroughly discussed by all teachers involved.

In all of the schools, but beginning at different times, within the three-year period, the courses in social studies and in English have been combined as one. In some of the schools, music and art in varying degrees of completeness have been integrated with the English and social studies. In a few cases, beginnings have been made in adding physical training and shops.

Generally, the entire experiment has been developed in the seventh and eighth grades. Such work as has been carried on in the ninth grade can best be designated as occasional. There is a strong tendency to extend the work into the ninth grade, this year, as indicated by actual work being done in two schools.

During the time the plan has been in operation it has been thought best not to hamper the activities of teachers and pupils by too much objective measurement and examination. Later, careful measurement of results will be attempted.

Meantime, a careful check of current subjective measurements has been made.

A canvass of teacher opinion has revealed a wealth of subjective judgments of fusion, its progress, effects upon teachers and pupils, reception by patrons, weaknesses and strengths, possibilities for the future, gains and losses sustained, and the like. A study of teacher opinion shows that conclusions reached, while by no means unanimous, are, nevertheless, strongly developed in certain directions.

For instance, in the matter of changes produced in the teachers themselves, ninety-one per cent of the teachers involved state that the fusion of subject-matter has made teachers more responsible and responsive to the child. Ninety-five per cent of these teachers declare the fusion of courses has given them greater understanding of the worth of the work of other departments, and of the necessity for a close correlation of the offerings from all fields of learning. Eighty-seven per cent of these teachers are of the opinion that the fusion of courses caused them to know their pupils more thoroughly, and, therefore, has brought about improved guidance of pupils.

Almost four-fifths (seventy-nine per cent) of the teachers believe that students have shown improvement in understandings and in ability to acquire information independently. Pupils, it is reported, are not confused by differing directions given by two or more teachers instead of by one, and are guided in seeing relationships, rather than left to their own devices in the hope that they may discover them. Corollary to statements concerning improved understandings and independent investigations are statements that reveal improved use of dictionary, encyclopedia, and similar sources (80%). Supplementary readings in geography, history, and allied fields are likewise (90%) reported as much improved.

Two-thirds of the teachers (sixty-seven per cent) are convinced that pupils are showing increased capacity to solve problems (to think).

Librarians, generally, state that, as a result of fusion of subjects, pupils are reading more extensively than before. Incidentally, they add that there is grave need for new type books in both English and social studies, adapted to new needs being developed by reason of fusion courses. The brighter children fare best in adapting to unsuitable sources of material; the duller children fare worst. The brighter children are increasing in power; the duller children are declining in the effectiveness of their study. The brighter children are successfully challenged; the duller are overwhelmed.

Pupil interests in other fields, teachers think, have largely improved—most in current events, and next in fine and industrial arts. Here teachers are not so certain as in other elements reported above, because they realize their own interests have widened, and, therefore, affect the interests of pupils in other fields.

Appreciations and attitudes, say a majority of teachers, have improved. Within the limits of this article, the catalogue of appreciations and attitudes, and their varying percentages of improvement, cannot be offered. Suffice it to say there is majority opinion to sustain the idea throughout the list of marked growth and improvement. It is, perhaps, unnecessary to add that teacher opinion in this field is sustained by practically no genuine objective evidence.

Certain of the skills, in the estimation of teachers, have shown slight decline. Others have shown decided improvement. Sixty-one per cent of the teachers state that written composition has fallen off, particularly as regards spelling, punctuation, and other mechanical skills. Seventy-eight per cent say oral expression has improved. Speech defects are better overcome, enunciation and pronunciation are more correct and exact, and poise much more developed. Improvements noted are to be found in the preparation and delivery of class talks and recitations, in speeches, and in dramatic presentations. Teachers, generally, have been unwilling to commit themselves on the moot question of grammar skills. They have been willing to say that grammar is studied *for use* more than before. Correct grammar usage in speech has shown advance over the past, with much more interest manifested by pupils. Pupils, too, comment more upon the beautiful speech of those who so speak in their presence. The influence of the radio has an undoubted part in pupil-interest in better speech, but to what extent none can at present determine.

Reading, as previously stated, is more extensive. In the field of literature, there has been a decided shift in reading preferences. Fiction is growing in favor; poetry is declining.

Many literature teachers deplore the falling off of reading in the "classics", in poetry other than dramatic forms, and in essays. All are willing to concede gains in biographical reading, and in the marked increase of reading in the newspapers and current magazines. More and more, this reading of newspapers and magazines is being recognized as valuable, first, in helping pupils to understand and appreciate their own times, and the problems related thereto, and, second, as a basis upon which to build ever better tastes in reading. Incidentally, pupils seem, on such a basis, to expand their vocabularies more richly and more readily than upon other bases. Here, again, functional use appears to be a most important element in learning.

There are some teachers, a minority, who feel that increased emphasis upon the social studies in relation to English has resulted in pupils who are more "fact conscious" but less imaginative and idealistic. This estimate of the effect of a shift in reading fields should be given careful study by all concerned.

Creative efforts, on the part of children, have improved, say fifty-seven per cent of the teachers; have declined, say twenty-seven per cent. An appreciable proportion of the teachers are undecided on this point (sixteen per cent). Former teachers of English predominate among the dissenters and doubters.

Teacher Suggestions for Improvement

After studying fusion, for a period of from one to three yeears, teachers are ready to offer many suggestions for further improvements in methods of dealing with the unified courses.

One recommendation, often made, is that a specific amount of time be set aside in the daily or weekly schedule for more emphatic drills in spelling, grammar, and handwriting, to overcome weaknesses steadily becoming obvious. The need for written drills is dwelt upon prominently.

A second frequent recommendation is that the curriculum be speedily and constantly revised in accordance with classroom findings, along broad unit lines, and including all possible sources of materials from all fields. Trained in single subject fields, teachers feel the need for curricular materials, jointly developed, accompanied by suggestions in methodology adapted to changed materials. This demand is particularly heartening to all who have a part in organizing and developing the fusion idea, since it promises much for future growth, and controverts the accusation, sometimes made, that teachers are unwilling to advance into new ways.

Closely allied to this second recommendation is the call for new texts and other forms of materials organized to meet the specific needs of the new courses.

Meanwhile, teachers are making commendable progress in developing units of their own fashioning. Out of necessity, they are learning resourcefulness and independence. Teachers recognize that units so developed, however, grow less and less alike. Though freedom is desirable and acceptable, teachers recognize that a certain unanimity of offerings in the various rooms and schools is essential to the unified progress of pupils when they have been promoted to the senior high schools.

Teachers Recommend College Courses in Teaching Methods

Teachers recognize that they were, most of them, trained as subject specialists, and that, therefore, they tend to emphasize subject matter, according to their own previous training and

experience. They recommend, for that reason, that college courses, especially extension and summer school courses, be offered to assist them in their teaching problems. Such courses are notable for their absence from the catalogues of colleges and universities.

Until such courses are developed, teachers recommend increased emphasis upon training in service, thereby offering a challenge to administrators and supervisors.

Another wise recommendation, frequently offered, is that parents and other patrons of the schools be thoroughly advised as to purposes, plans, procedures, and expected outcomes of fusion. In coöperation with the various Parent-Teacher Associations of the city, much publicity has been given to fusion. The goal, here, must be complete understanding by the public. As long as any confusion exists in the minds of citizens, there can not be complete acceptance of this or any other plan which departs from the strictly traditional.

A fourth recommendation, which it is sincerely hoped may be met in the near future, is that scientific means be found for testing procedures and evaluating results. Teachers are ready to have their subjective judgments speedily supplemented by objective study, in order that the work of the past few years may have increasing meaning and value. Confidence in new planning, new methods and procedures, new courses and units will be enhanced by adequate and reliable measurements. Much of the work done cannot be so measured by the standardized tests, which have been developed for use in an entirely different set-up. The administration officials have before them the task of developing proper testing devices. If power tests are desirable, a technique for building them must be worked out and approved. If other objective forms of tests, suitable to the need. are considered necessary, they too must be created.

To date, through a period of from one to three years, Long Beach junior high schools have been dealing with the fusion idea on an experimental basis, with every freedom given to those engaged in the experiment.

It is widely agreed, now, that the time has come for a very careful study of results in terms of scientific appraisal. Added to opinions of accomplishments and failures, there must be careful analysis of all that has been done.

Teachers can and do know, within themselves, that they have become more tolerant of other teachers and of other subjects. They can and do know that they have a better understanding of the needs and difficulties of their pupils, and a more intimate knowledge of their pupils' interests and abilities. They wish to know, as surely, the changes which have occurred within the pupils—changes in attitudes, appreciations and understandings, changes in creativeness and in thinking power, all changes which have to do with the growth of the individual, and his adjustment to the society in which he moves and has his being.

The progress thus far made by the Long Beach junior high schools is true progress in that it has moved into frontier fields where thought is imperative and action necessary. It is progress, too, in that it is unfinished. There is nothing static about the whole experiment. All is activity. The next steps to be taken are clearly indicated; the next problems to be solved are recognized. Further progress lies ahead.

AN EXPERIMENT IN THE FUSION OF ENGLISH AND SOCIAL SCIENCE

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AT THE opening of the fall term of the San Francisco junior high schools in August of 1934, an experiment in the fusion of subject-matter of the English and social science courses was initiated by the supervisors of those subjects. A teacher of English and one of social science in the Roosevelt Junior High School were designated to put the experiment into operation.

The tentative objectives of the course were: 1. to bring about a pupil realization of the relationship between English and social science; 2. to develop pupil capacity for a thorough consideration of the social problems of the day, leading to a power to formulate and express clearly viewpoints thereon; 3. to effect a diminution of the pupil teacher contacts imposed by large classes, and thereby enable the pupil and the teacher to know each other better; 4. to increase the vital interest of the group for both subjects.

After consultation with the sponsoring teachers, it was thought desirable to work with groups of average ability rather than with pupils of either the highest or lowest mental levels. A study of the teachers' programs revealed the fact that the social science teacher had a suitable group of high seven pupils, and that the English teacher had a low nine group satisfactory for the purpose of the experiment. Accordingly, for two hours daily, the high seven class was programmed to the social science teacher, and the low nine class was programmed to the English teacher.

The work on the selection of materials to be used revealed that the elimination of a number of topics from each department course of study, counteracted by the introduction of entirely new subject-matter, seemed advisable. To keep the course flexible and vitally interesting, any rigidity or tendency towards crystallization was avoided.

Activities Carried On By Committees

At the first meeting of each of the classes, the plan was outlined and discussed, and its reception was enthusiastic. Organized as an activity group, the high seven class became The American International Relations Committee whose members had as their purpose the visitation of the various countries of the world. In turn, the purpose of the visits was to determine the interdependency of the countries. Detailed oral and written reports, which entailed excellent training in the use of the library, brought before the group geographic, political, and economic conditions of the countries visited, while the stories read with each unit disclosed the customs, manners, and cultures of the various inhabitants.

Letters, friendly and business, were written to members of the group from members who were supposed to be in different countries, and to business houses to secure circulars, folders, and information. From the pupils' viewpoint, the actual exchange of letters between the children of the Roosevelt and the children of other countries was most exciting. The names and addresses of the foreign correspondents were obtained from the International Club of San Francisco. These

lists included ages, parents' occupation, and children's hobbies or special interest. The letters were cleared through the class, that is, they were written and sent from the school, and the answers came to the school for the pupils in care of the class teacher.

The low nine class became a Junior Improvement Association which studied civic problems relative to the community. An important feature of the low nine class work was the daily radio broadcast of important world problems which opened the class period each morning. Written and oral reports, which gave the results of the investigations carried on by the committees into which the class was divided, made oral expression work vital for the ninth grade students. Names of older pupils who lived in England and Australia, supplied by the International Club, provided an opportunity for some interesting and purposeful letter writing between the Roosevelt members of the Junior Improvement Association and the boys and girls of other English speaking cities. This ninth grade group, however, went beyond the practical type of expression in several units of the course. A number of original short-stories, poems, and dramatizations of an imaginative character were the outgrowth of the class study of a unit on the culture of the United States.

All activities of both classes were carried on by means of committees selected by the students under the guidance of the two teachers involved, who, while encouraging a free expression of opinions, also directed the research work on difficult problems.

Extensive Use of School Library

The early development of the somewhat legalistic technique of demanding authorities for statements and viewpoints included in reports soon led to extensive use of the school library and its facilities. Inasmuch as part of the game was to catch inaccuracies, constant thought and attention were stimulated, and alertness was everywhere apparent. The pupil initiative in this direction was very noticeable as compared to the method under which the pupil waits for the teacher to call on him for his opinions and make all corrections. With much of the class procedure in the hands of the pupils, a new interest in the class work developed rapidly, and, since the course was flexible enough to allow for the inclusion of certain pupil suggestions, students felt that they had a part in determining their work for the term. They were justly proud of the responsibility placed upon them.

A number of difficulties were encountered in working out the two experiments at Roosevelt. These were in the nature of inadequate materials, insufficient numbers of books, and lack of room space. The interest, industry, and ingenuity of both teachers and pupils more than made up for most of these, however. Since the experiment was carried on for only the one term, it is difficult to come to any very definite conclusions. The low nine students expressed themselves as preferring to have their social science with one teacher and their English work with another. They said that, while they enjoyed the experiment as something different, they thought both courses were more interesting when taught separately. Members of the seventh grade group, who were not so accustomed to the separate classes of the junior high organization, liked the plan much better. This led the teachers to believe that it might be more suitable for seventh grade pupils, since these children sometimes find it hard to adjust themselves to the junior high school change of class every period.

Fusion Calls for Teachers of Superior Ability

It is the consensus of opinion of those who carried on this experiment that it calls for teachers of superior ability. From the teachers' viewpoint, a valuable accomplishment of the experiment was the diminution of pupil contacts per day, thus eliminating certain clerical work such as the recording of ninety names, now reduced to forty-five; ninety grades now reduced to forty-five; the correction of the papers of ninety pupils, now reduced to forty-five. But, overshadowing this accomplishment, was its corollary, to-wit, that the increased hour association per pupil per teacher by an almost mathematical formula equalled an increased pupil teacher acquaintance. The problem of the large class, swelling steadily for the past ten years, is almost at a crisis. When the term pupil-teacher association is multiplied by forty-five or fifty, and this quotient is multiplied by five or more periods a day, and this quotient is again multiplied by the number of school days in a week, the result is appalling. Under these conditions, for a teacher to know her pupils as individuals is impossible. The best that even the most conscientious teacher can do is to teach at the group as a whole. The contribution which fusion makes towards the easing of this stress alone would entitle it to serious consideration.

MUSIC HATH CHARMS*

EDWIN A. LEE
Superintendent of Schools, San Francisco

MUSIC HATH CHARMS, most truly. Here in the studio, on Sunday morning at the cold, gray hour of 7:30, Pacific Time, are gathered 150 high school students. Glenn Wood's chorus from the Oakland High Schools, which you are shortly to hear, must have arisen before six in order to be here. The San Francisco Balboa High School band may possibly have napped a few minutes later, but you will have to admit that their playing indicated quite clearly that they are now fully awake. Aye, music hath charms when it can get high school students out of bed on Sunday morning!

Have you ever thought of what the world would be like if there were no music? Suppose there were no songs, no violins, no trumpets, no drums, no bands, no orchestras. What a barren place it would be, and what a large part of the joy of life would be taken from us. One thing I know, I should not want to live in such a world. And why not? There are many reasons. They range from purely physical reasons, which sets the toe a-tapping and the blood tingling, through emotional reaction to beauty in all its varying shades, to the rapture which comes through participation in the performance of a great masterpiece.

It is with regard to the last that I wish to speak in the few minutes allotted to me on the program. Music is essentially a coöperative enterprise. Teamwork is a primary consideration in everything except a solo, and even then there must be complete coöperation between the soloist and the accompanist. You will hear, shortly, the Saturday Morning Choir from the high schools of Oakland, California. In this organization there are seventy young men and women. Some are sopranos, some are contraltos, some tenors, and some basses. They will blend their voices together in harmony and oneness in order to produce beauty. Each will sink his individuality into the ensemble for the good of the whole. Each will bend his will to the will of the conductor, in order that there may be precision of attack, accuracy of intonation, intelligence of interpretation.

It happens that we have a band and a choral organization in the studio this morning. There might just as well have been an orchestra, or a string quartette, or a piano ensemble. No matter which ones had come, there would be the need for coöperation and skill and intelligent performance.

I am interested not only in what these children get now but what it will mean to them all through life. To music they may

*Radio broadcast, Station KPO, Sunday, November 3, 1935; 7:30 a.m.—5 min.

turn for as long as they shall live for joy, for relaxation, for creativity, for self-expression, and in the doing they will not take from anyone else. Rather will they contribute, for music is to be heard as well as performed.

Someone has said that music is the universal language, and truly it is. Music notation is the same everywhere in the Occident. Its appreciation is not limited by race, or nationality, or creed. It stretches back into the dim past even farther than the written records of mankind. It voices our aspirations for the future. It is our solace in time of trouble. It spurs us to greater effort in time of crisis. It relaxes us when we are in need of rest.

There are some who think music has no place in public schools. "The man who has no music in his soul is fit for treason, stratagem, and spoils," seems to me the most fitting thing to say concerning such critics. My own feeling is that we should have more and better music all through the school life of children. Every boy and girl should learn to read music as easily as he reads a book. Every child should experience the joy of part singing, and, as he increases in musical skill, should come to know the great masterpieces of choral literature—the masses of Bach, the oratorios of Mendelssohn, the operas of Verdi and Wagner and Puccini, the madrigals of England, and the rich folk music of all nations.

Every child, too, should have the opportunity to play an instrument in some form of ensemble. Here, again, as he grows in skill, the almost inexhaustible wealth of instrumental literature opens up. The symphonies of Beethoven and Tschaikovsky, the waltzes of Strauss, the string quartettes of Dvorak, the compositions for wood-wind ensembles, the concertos—the list could be extended indefinitely. I have heard high school orchestras play with such fire and musicianship as to sweep a great audience off its feet so that they cheered and threw hats into the air. I heard, only last week, a junior high school orchestra play selections from Tannhauser, and Gilbert and Sullivan's immortal "H.M.S. Pinafore." Such experiences are priceless in their value to children, and continue with them into adult life.

I cannot over-emphasize my belief that music is as fundamental to the education of modern youth as any subject in the curriculum. If you doubt it, listen to the members of the Oakland Saturday Morning Choir who, week after week, for the joy of singing, give up their Saturday mornings to rehearsals. They will persuade you that music, indeed, hath charms!

DEVELOPMENT OF A NEW REPORT CARD IN THE SACRAMENTO SENIOR HIGH SCHOOL

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Sacramento Senior High School

A PROBLEM confronting thinkers in education today is the question of devising modern systems of student accounting and reporting. In trying to solve his problem, educators have presented many revisions of student accounting and report cards. Some of these new systems are complex, and some seek to eliminate all traces of the traditional marking code. Some are the result of rebuilding the curriculum, and some have come from attempts to oust the ancient prejudice against grades. In view of this nation-wide interest in the problem of grades and grading, it is timely to present a discussion of the endeavor made by the Sacramento High School to meet the demands of modern education in the field of student analysis and reporting.

The first step in revising any traditional system is to discover the principles lying in the reform. The sources of the demands must be explored, and the practical limitations upon the result must be considered. The product will be used by real people at real work. Beyond the school are the interested groups of parents who must be able to understand the aims of the school. Above the secondary school is the university with its demands, and the state and local laws which must be met. The proposed reform must seek to unite the desired changes with the circumstances and personalities involved in the change.

In order to cover his first part of the general program of revision, the principal of the Sacramento High School in 1933 appointed three faculty committees to work for one school year to gather information leading to the reformation of the current system of grading and reporting. The committees worked through conferences with teachers, administrators, and laymen. The conclusions may be summarized as follows: First, the community felt that citizenship should be scored in the final grade; second, the current grading system could either be totally abolished, or so changed to present a clear, analytical picture of the student; third, other schools had introduced many various plans, all of which offered desirable features for consideration. It was finally resolved to continue the next year with experiments offered voluntarily by faculty members, in using new methods of student analysis.

On the basis of the findings of the committees of 1933-1934, the 1934-1935 faculty committee set to work. In reopening the subject of revision, it was found that eight deficiencies in grading could now be definitely listed. They were:

1. A lack of standards in accounting clear to teacher, pupil, and parent.
2. A lack of definiteness in the grade.
3. A lack of knowledge of the factors in the grade.
4. A lack of understanding of the terms employed in any system so far devised.
5. A need for stressing human values.
6. A need for greater objectivity in the grade.
7. A need for systematizing terminology and the meaning of terms.
8. A need for fitting factors and descriptive terms to the general objectives of education and to the specific objectives of each course.

Meeting these lacks and needs of reporting was the program for the year 1934-1935. Any card presented at the

close of the year must overcome these deficiencies. First, the groundwork must be built. In order to accomplish this task three methods were adopted. They were: First, to study the voluntary plans in student accounting; second, to obtain information from students; third, to solicit specific information from all teachers as to actual current practice. The final portion of the program was to discover and recommend specifications for grades from the material gathered, and to present a report card which would be in accord with the demands of teachers, students, and parents.

The first study dealt with the plans for daily student accounting. These plans were offered voluntarily by teachers to the committee. While the experimental systems were in operation in selected classes, the committee analyzed them to discover basic principles of grading. In these plans, the teachers analyzed the work in the courses in accordance with the objectives, itemized all the factors in the grade including citizenship, and balanced the tabulations for the final grade.

In studying these plans it was discovered that subjectivity could not be eliminated, but that objective items might and should be determined. It was further found that in all there were two general factors in determining the grade, subject, and character. In most of the plans these general factors were further analyzed. Subject included both content and skill, and character included personal habits and social attitudes. Ways and means were offered for the tabulation and recording of the items in the grade. When the voluntary plans received the approval of the committee and the principal, they were published for the consideration of the entire faculty.

The next part of the work was the study of student sentiment on grades. Several hundred students were asked to tell what a grade meant to them. Some of the answers in order of frequency were:

1. Quality of work.
2. Spur to do better.
3. University entrance.
4. Something worth while.
5. Accomplishment.
7. Progress.
11. Effort.
13. Payment for work.
20. Economic or social advantage.
25. A goal.
28. Citizenship in school.

It is easily seen that students did not have a clear conception of the grade as the teacher might give it. There was, as may be seen in the tabulation, a tendency to regard the grade as a specific symbol of a judgment, or as a concrete goal. The factors of content, skills, personal worth, and social attitudes are there, although unclear and confused. This confusion, existing between teacher and pupil, resulted from the indefiniteness and lack of clarity of the report card itself.

The third step in building the groundwork was the study of what all the teachers in the high school thought should be included in the grade. To this end each teacher was asked to write his or her specifications for the grade A. One hundred and fifteen responses were returned. In general, the answers showed the following:

1. A use throughout the faculty of numerous items in determining a grade.
2. A variability of combining the items.
3. A use of many varied and overlapping descriptive terms.

At the time, the responses were tabulated tentatively under the three headings of Subject-Matter, Skills, and Attitudes. After the reduction of obvious synonyms, the result appears as follows:

	No. of replies indicating use of items
I. Use of Subject-Matter in Grading	
Amount (completion)	102
Quality	7
Extra Work	4
Progress	2
II. Use of Skills ("tools," talents, subject skills) in Grading	
Ability	26
Accuracy	22
Originality	17
Method (preparation, etc.)	13
III. Use of Attitudes, Personal and Social, in Grading	
Coöperation ("citizenship," etc.)	44
Industry	39
Initiative (leadership, etc.)	29
Punctuality	24
Attendance	22
Conduct	18
Courtesy	15
Responsibility	12
Neatness	9
Obedience	8
Enthusiasm	8
Carefulness (property, equipment, persons)	7
Personality (pleasantness, cheerfulness, etc.)	6
Honesty	2

Summary of the Use of Factors in the Grade A

	No. of teachers using combined factors
I. Subject-Matter, Skills, Attitudes	64
II. Subject-Matter and Attitudes	29
III. Subject-Matter and Skills	11
IV. Subject-Matter	9
V. Skills and Attitudes	2

It is clear from the above summary that a great majority of teachers included more than the traditional "subject-matter" in making the grade. In analyzing the group headed Attitudes, it was found that it was impossible to describe in any one word a unity that might be supposed to exist between personal worth and social conduct. It was discovered that there is a close parallel in the use of both "coöperation" and "industry." In no case was personal worth considered without social attitude. Furthermore, no answer considered the two qualities as a single entity. The discovery that (among the teachers) both citizenship and personal habits entered into the grade, along with skills and content, tallied with the deductions made from the experiments in accounting and the students' answers.

The groundwork for the preparation of the report card was now completed. The final part of the program was to offer definite specifications for grades, and to present a report card with these specifications. In this, the aim was to unite the objectives of modern education with the practical demands of teachers, students, and laymen. For this task there was now available the whole amount of the previous study, which covered a period of about a year and a half. Material had been collected from all the interested groups, the community, the teachers, and the students. Out of this data came the demand for greater objective analysis, the four factors in the grade, and the demand for clarification of terms.

The specifications for grades had to answer these demands, and the card had to present the composite result in a way as to be usable by all teachers. To achieve this aim it was agreed that a rating scale was the preferable form. In order to maintain the single final grade for purposes of filing and transfer, it was decided to present the final grade as a synthesis of the items on the rating chart. The rating scale must, therefore, consist of the four factors of the grade. Each factor would be subdivided into five degrees. This five-point scale, A. B. C. D. F., was agreed upon out of deference to common practice and understanding.

The task of finding accurate names for the four factors was difficult. It was necessary to discover the clearest, simplest, and most inclusive terms.

After a review had been made of the collected materials, the following terms were chosen:

1. Subject Accomplishment.
2. Use of Skills or Knowledge.
3. Personal Responsibility.
4. Social Responsibility.

The term, "subject accomplishment," covers the content, or "meat," of a course, that is contained in books or materials. "Use of skills or knowledge" means the use of whatever opportunitty a course offers for the application of talents or acquired knowledge. "Personal responsibility" covers the student's development of personal habits, and his or her personal growth after having taken the course. "Social responsibility" was the term selected to cover the whole of the student's participation in class, his relationship to other students, to the teacher, and to the school itself. The term goes farther than "citizenship," which often is vague and ill defined in its use.

Succeeding the selection of names for the factors, was the work of supplying sentences to describe the factors. Again the demand for inclusiveness, clarity, and simplicity must be met. The following sentences were chosen:

1. Subject Accomplishment: Achieves an understanding of assigned work.
2. Use of Skills or Knowledge: Applies acquired knowledge or skills to the solution of problems.
3. Personal Responsibility: Shows diligence.
4. Social Responsibility: Shows coöperation.

The reasons for the selection of these sentences may be briefly summarized.

1. Achieves an Understanding of Assigned Work. Each course has in it a prescribed content. The act of achieving an understanding of this content is an important part of a course. The burden of achievement lies with the student.

2. Applies Acquired Knowledge or Skills to the Solution of Problems. All courses possess a progression from the easy to the difficult, from the simple to the complex. All courses allow for the display of native talent, or the development of subject skills. Herein may lie the test of a student's progress. A raw talent is unmeasurable, but may be measured in the application. The same judgment may be given for any acquired training, manual or mental.

3. Shows Diligence. The word, diligence, covers the use desired. It is more general in its meaning than any one of its synonyms. Diligence implies activity on the part of the person. The diligent student is industrious, careful, and willing. Finally, the word has the advantage of being understood by both parents and students.

4. Shows Coöperation. This phrase includes all the social qualities which modern education upholds. The meaning is clear to parents and students, because the word, coöperation, is used outside the school to cover the desirable qualities common to all life of a social nature.

It was necessary, next, to choose adverb modifiers to determine the meaning of A, B, C, D, and F. These modifiers were to be used with the sentences above, and must offer a genuine gradation from excellent to failure. For the factor, Subject Accomplishment, these five were chosen:

A. Fully.
B. Satisfactorily.
C. Partially or Sometimes.
D. Poorly or Seldom.
F. Inadequately or Never.

For the other three factors the following were selected:

A. Always.
B. Usually.
C. Sometimes.
D. Seldom.
F. Rarely or Never.

The closing portion of the program was the preparation of the card itself. In designing a true report card there are four facts to consider. First, all the administrative data must be recorded. Second, the relationship between the home and the school must be expressed. Third, the grade must be distinctly displayed, and the reasons for the grade shown. Fourth, the card must be so designed and arranged to be easy to handle and understand.

The card finally selected answered all these demendas of form, space, and presentation. The analysis of the grade is designed in the form of a graph. The composite grade, the "mark," is preserved for university and registry uses. There is space for a personal communication from the teacher to the parent. The card is simple, handy, and legible. The card has attempted to achieve the aims and principles discovered and formulated during the past years; it has met the lacks and needs which have long gone without answer. In short, this development of a new report card, through the active participation of teachers, students, and laymen, certainly is a democratic way of solving this problem, and it promises to prove satisfactory alike to teachers, students, and parents.

EDITOR'S NOTE: Our readers who desire a copy of the new report card described in Mr. Howe's article should address the author at the Sacramento Senior High School, Sacramento, California.

THE TEACHER'S PHILOSOPHY

GEORGE H. MERIDETH
Deputy Superintendent of Schools, Pasadena

SHALL *a teacher have a well defined social philosophy, and to what extent should it affect his teaching?*

The Effective Teacher

I. A teacher is most effective when he evidences those traits which are desired in any normal (well-balanced, well-adjusted) person who is living a well-rounded, forceful, integrated life.

a. The individual teacher is most effective when he possesses a sense of adequacy with respect to his environment.
b. Any teacher who possesses a life philosophy and a philosophy with respect to social matters will, to a great degree, possess the possibility of having a normal point of view, a normal outlook, and a challenging personality.

II. One would, therefore, contend that the teacher in his various relationships with the student can be most effective by evidencing a possession of a well-founded and well-rounded social philosophy. This social philosophy, or frame of reference, with respect to social matters will serve as a basis of determining what is significant in life for the individual, and what is important for the social well-being of our nation as a whole.

III. What are the desirable characteristics of a social philosophy? One's social philosophy should be characterized by an appreciation of a scientific outlook, a scientific method of gathering data, the drawing of tentative conclusions in a logical manner, an appreciation for truth, a proper consideration for the personality of the individual, and an ability to see significant matters in their proper relationship to life over a long span, herein using historical information and perspective as a means of checking present happenings, a tendency to take a long-time view of matters in forming judgments. A desirable social philosophy involves a commitment to the principles that natural resources belong to all of the people, that all of mankind deserve the privilege of work and normal expression, that we have an obligation to provide conditions under which

all will secure the minimums of life, that is, food, shelter, and clothing, plus opportunity to keep alive in themselves the drives which lead to good life, and, above all, that a spirit of tolerance be maintained for the frame of reference of one's fellow man.

IV. How shall one use his frame of reference in teaching?

a. The frame of reference should be the basis or guide, shaping the behavior of the teacher in his personal life.
b. This frame of reference or social philosophy should be the instrument with which he determines with his students what is significant. They weigh movements and trends in terms of the matters pertinent to this social philosophy.
c. Out of this pattern of a social philosophy, he should contribute to an environment which will so enrich the experiences of the individual students that each may evolve for himself a frame of reference that may serve as a guide to the student in the same personal way that the frame of reference may be of value to the teacher.

V. How do difficulties arise in situations in which teachers wrongly use their social philosophy in their teaching?

a. A belief that there is only a single way to attain the goals set up in one's social philosophy is what would be called a narrow frame of reference. For instance, should one proclaim that these goals for society, referred to above, can be obtained only through the manipulation of the particular political party with which he is associated? This would be operating from the basis of a narrow frame of reference. Or should one insist that only the facts that he has chosen to consider are pertinent to the matter under consideration? Again, he would be operating from such a limited point of view as to be guilty of drawing faulty conclusions, or placing himself on a basis that is other than democratic. He would necessarily fail because of such procedure.
b. Should a teacher working with younger students so manipulate the situation or present such partial data as will cause students to come to conclusions on a basis over which he has rather absolute control, he would be guilty of violation of the trust imposed in him by society at large. On the contrary, should a teacher, dealing with adult students at the college and university level, desire to present a point of view which is his own, and which is indeed quite different from the commonly accepted point of view, and state his position only as that of one man's point of view, and provide opportunity for students to hear or read materials which will give an equally able discussion from the other angle, he would be, in my opinion, operating within his privileges as a professional teacher.

VI. By way of summary, these special considerations should be kept in mind:

a. The teacher who is the normal (well-balanced, well-adjusted) individual is effective in his work.
b. The teacher who is normal has a sense of adequacy.
c. A sense of adequacy is contingent upon one's having a well-defined, working, social philosophy.
d. This social philosophy should be sufficiently broad as to serve as an instrument of proper evaluation and interpretatian of life situations.
e. One violates the principles of good taste, good ethics, and good judgment when he operates with such a narrow frame of reference as to indoctrinate or condition the point of view of immature students.

HIGHLIGHTS FROM THE MAGAZINES

J. MURRAY LEE
Director of Research, Burbank City Schools

For a change, we wonder if you might not enjoy a few clippings which were snipped this month for the "catch-all" which collects a few good things now and then. If you don't, let us know. (We would like to make the acquaintance of the one person who reads this page.)

"The chief reason for a new curriculum and educational procedure lies in the fact that our modern social and thought world has brought forth significant new developments which, in their turn, make demands on the school that intelligent and conscientious educators can no longer disregard."

"We need institutional changes. The acutest lag, perhaps of all lies in the failure of social thought and moral effort to grapple adequately with these new conditions and possibilities. Meanwhile, our civilization suffers."

—W. H. Kilpatrick, *N.E.A. Journal*, November.

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"It is the social emphasis that is needed in America at this time—an emphasis that, in large measure, has been lacking. Many who occupy positions of educational leadership are still not interested, or worse, plainly irritated, by the continued discussion of our social responsibilities. But, like Banquo's ghost, the social problem will not down—it will continue to force itself to the forefront of our discussions until the social outlook of the educator will become the most important fact to be known about him."

—Jesse Newlon, *Phi Delta Kappa*, November.

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"I do not recall a time when there was more criticism of our teacher folk for failure to realize that the world has moved swiftly away from our ideas of what is the proper work of the schools. We can't stop the fault finding. We can hope it will stir us into improvement.

—Wm. McAndrew, *Nation's Schools*, November.

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"The teachers of America are standing at the crossroads. Either they will sell their souls for a mess of pottage, become mere weather vanes, lifeless and spineless, pointing the path of the strongest breeze of the moment, or they will rise to the stature of free men and women dedicated to the service of truth, regardless of the opposition. They must organize strongly, teach fearlessly and honestly, and courageously inform the public of the state of education, to the end that free schools and free teachers for a free people may become a reality." —

—John W. Wilson, *The Educational Scene*, November.

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"If, as citizens, our young people are later to face unsettled and controversial issues, they must begin *early* to work at unsettled and controversial issues. Merely to study past and now settled problems is no adequate preparation for dealing with live and unsettled problems. . . . What we wish is that young people shall build, each for himself, an effective social intelligence by working at live-issue social problems, so that they may accumulate and organize knowledge on one hand, and methods of study and attack on the other."

—William H. Kilpatrick, *Teachers College Record*, November.

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"With so many children growing up under abnormal conditions involved in relief and the money hardships created through the depression, it is imperative that everything possible be done to offset the demoralizing and deteriorating effects of the great disaster that has befallen the country."

—Miss Lenroot, *Childhood Education*, November.

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The general grade average of 9.16 is probably the most accurate statement yet made of the formal schooling of America's wandering boys. It is certainly not one for the boys themselves to be ashamed of. Rather, food for serious thought is offered by the fact that thousands of American boys, in spite of average educational training, are not being adequately cared for economically, socially, and recreationally, and are taking to the open road in an attempt to find something better somewhere else. One cannot help but wonder what part the degree of formal schooling and the educational system itself played in causing these boys to take to the road in the first place.

—George E. Outland, *School Review*, November, 1935.

"In reading hundreds of statements written by these young people, one is impressed by their egocentric attitudes. They seem to want to combat crime, disease, and poverty by themselves, rather than by working with others. They want to whip the world alone.

It is not enough that youth be eager to build a better world. Some means must be provided to promote among our future politicians and statesmen a sympathetic understanding of the importance of working with others, and to develop in them the skills which will make group thinking and group action more effective. Here is an opportunity, a great opportunity, for the secondary school."

—Harry H. Moore, *Social Studies*, November, 1935.

With attention focused on mathematics, we must digress from posting clippings to mention the "Third Report of the Committee on Geometry" in the *Mathematics Teacher* for October. It contains material with which all mathematics teachers should be familiar.

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A new publication entitled the *Education Digest* has recently been issued which contains condensations of noteworthy articles taken from the leading professional and lay publications. The Editorial Advisory Board of this new magazine is made up of eighteen of the leading educators of the nation. The *Education Digest* is of the popular small size which fits into the coat pocket without folding. The editorial offices are in Ann Arbor, Michigan.

EDUCATIONAL NEWS AND COMMENT

Conference on Secondary Education

The California Society of Secondary Education will present a significant program on problems in secondary education, as a section of the C. T. A. meeting, Thursday, December 19, at 2:00 p.m., in Mudd Hall of Philosophy, (Bowne Hall), The University of Southern California. The program follows:

John W. Wilson, Principal, David Starr Jordan Senior High School, Long Beach, presiding.

(Each report is limited to eight minutes.)

Current Happenings in Secondary Education

1. "The Experimental Coöperating Schools of California," Dr. Aubrey A. Douglass, Chief, Division of Secondary Education.
2. "Commission on Relations between Schools and Colleges," Miss Helen Babson, Principal of Eagle Rock High School.
3. "National Youth Administration Movement," Miss Anne de G. Treadwell, California Youth Administrator.
4. "The Youth Survey, by the Council of Education," Dr. John Harbeson, Dean of Pasadena Junior College.
5. "Report on the Briggs Committee," Arthur Gould, Assistant Superintendent of Schools, Los Angeles.

Clear Thinking Through the Use of Subject Materials

1. "Social Studies," Wellington G. Pierce, Teacher of Social Studies, Woodrow Wilson High School, Long Beach.
2. "English," Dr. Thomas H. Glenn, Head of English Department, Santa Ana Junior College.
3. "Language," Dr. Joseph A. MacKnight, Language Department, Woodrow Wilson Junior High School, Glendale.
4. "Science," Dr. Charles F. Eckles, Teacher at Pasadena Junior College, Pasadena.
5. "Vocations," A. P. Mattier, Head of Mechanic Arts Department, Compton Union High School.
6. "Mathematics," Dr. Samuel E. Urner, Professor of Mathematics, Los Angeles Junior College.

Summary

Dr. Frank Charles Touton, Vice-President and Director of Educational Program, University of Southern California.

Junior College Association Meeting

The Southern California Junior College Association held a meeting on the campus of the University of California at Los Angeles, October 29, with an attendance of about 500.

W. W. Mather, Chaffey District Junior

College, President of the Association, presided. Greetings were extended by Dr. Merton E. Hill. The highlight of the general session was a splendid address on "Education Beyond the High School—a Trend and a Development," by President Robert G. Sproul, of the University of California.

Section meetings, well attended and highly interesting, were held in the departments of:

Administration, art, biological sciences, business education, deans of women, engineering and mathematics, English, foreign languages, home economics, journalism, library, music, physical education for women, physical science, registrars and counselors, speech arts, and social sciences.

Uniform numbering of courses was a topic of special interest, and reports showed that many of the junior colleges have adopted this system.

Twenty-Fifth Anniversary of Graduate School at U. S. C.

Outstanding as a gathering of prominent educators to discuss the latest developments in the fields of letters, arts, and sciences was the three-day conclave held at the University of Southern California, November 21 to 23, as an anniversary celebration of the institution's 25th inauguration of graduate studies.

Over 100 educators, deans, ten university and college presidents, and a United States Senator were guests of Dr. R. B. von Klein-Smid, U. S. C. president, with Dr. Rockwell D. Hunt, dean of the Trojan graduate school, acting as general director.

Highlights of the conference on the S. C. campus included the awarding of honorary degrees to four distinguished guests. To United States Senator Elbert D. Thomas from Utah the degree of LL.D. was conferred; to Carl E. Seashore, dean of the graduate school, University of Iowa, the degree of Sc.D.; to Dr. Hamlin Garland, nationally known literary figure, the degree of Litt.D.; and to Dr. George Zook, president of the American Council on Education, Washington, D. C., was awarded the degree of LL.D.

Panel discussions occupied the afternoon and morning of two days, including the fields of education, psychology, religion, philosophy, history, international relations, physical, biological, and social sciences. Addresses were given by Dr. Egon Brunswik, University of Vienna; Dr. George A. Coe, professor-emeritus, Columbia University; Dr. Edwin R. Guthrie, University of California; Dr. Dougald MacMillan, University of North Carolina; Dr. Hans N. von Koerber, U. S. C.; Dr. C. A. Kofoid, University of California; and Dr. Henry R. Fairclough, Stanford University.

Special publications by the university were issued for the celebration, including a compilation of the 5000 graduate theses by U. S. C. students during the past 25 years, and brief annotations of each subject, prepared by Dr. E. S. Bogardus.

Closing the convocation, Dr. George F. Zook warned educators that "universities offering graduate work should state frankly their objective . . . we should take precautions against admitting inferior students; not allowing them to build up false hopes concerning their future careers as scholars and teachers."

Master's degrees, he believes, should be eliminated as a research project. "It should be regarded as an extension of undergraduate education . . . to secure a more rounded training to the student than an effort to contribute to the world's supply of knowledge."

He concluded that "development of graduate work in the next twenty-five years will be as significant as that of the past quarter-century."

A SELECTED AND ANNOTATED BIBLIOGRAPHY

Economic Plants. Stanford, Ernest Elwood. Appleton-Century Co., 1934.

This book is a part of the Century Biological Series. While it was not primarily intended for secondary school use, it will be found well adapted to the high school library or for supplementary use in the class room. It is simply and interestingly written, with full accounts of the way in which the plants are grown, harvested, and processed. It is not a mere botany of plants that happen to be of economic importance, but full emphasis is given to their geographic, agricultural, and industrial relationships, and even to their effect upon human cultures. The 376 well-chosen illustrations add much to the value of the book.

—*J. H. Snook,* Stockton High School

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In the Field of Home-Making

Earning and Spending the Family Income. A Textbook in Home Economics. Friend, Mata Roman. New York; D. Appleton-Century Company, Inc., Revised Edition, 1935, 463 pp., $2.00.

In this book the author has brought together, skillfully, material that has been somewhat scattered and unorangized. The material on family finances deals not only with how to, but with why, to select articles for the family, as well as how to purchase and to fit purchases into the total amount a family has to spend. The material is readable and interesting, because expressed simply and in a personal way. Noteworthy features of the book are the soundness of the subject-matter and avoidance of extremes and the practicable approach to family finances through plans rather than through records.

The Arts of Leisure. Greenbu, Marjorie Barstow. New York: McGraw-Hill Book Company, Inc., 1935, pp. 274, $2.50.

A good philosophy for us who have so little time and money to do the things we would like. This delightful book shows you how to make life richer and more enjoyable through the arts. A home maker as well as a teacher will like the charm of leisure suggested here.

The Art of Leadership. Tead, Ordway. McGraw-Hill Book Company, Inc., 1935, 299 pp., $2.50.

This book will be found of great value to teachers for their personal use, and for the teaching of "Units in Personality." A study of Chapter IX, "Methods and Manners of Leading," shows that leading can be more productive than bossing.

Home and Family. Jordan, Helen Mougey; Giller, M. Louisa; and Brown, John Franklin. New York: The Macmillan Company, 1935. 426 pp., $1.60.

Problems of home and family life are presented for high school classes, boys as well as girls, from the point of view of their special interests. Emphasis is placed on personal relationships, although attention is also given to the choice and care of household goods and services. There is a general introduction on the home and family, then units on the material home, the successful family, management, child development—the longest unit, the family as an institution, and the family as a personal problem.

The Boy and His Daily Living. Burnham, Helen A.; Jones, Evelyn G.; and Redforn, Helen D. Chicago: J. B. Lippincott Company, 1935. 363 pp., $1.80.

The book will make a satisfactory textbook for boys of the senior high school level. A presentation of daily problems of boys and girls in school and at home should stimulate boys to further study. This is the first book written for boys, and will be welcomed by Home Economists who have had to ust "sissy books written for girls."

—*Reported by Iris H. Albert, John C. Fremont High School, L. A.*